JOURNAL OF THE IRON AND STEEL INSTITUTE

VOLUME 179 1955

SUBJECT INDEX

[References to papers and articles given in full text are indicated by the word (*Paper*) following the page number.

Indexing of Alloy Steels and Other Alloys: In the indexing of alloy steels, carbon and iron are ignored and the alloying elements contained in the steel are arranged in alphabetical order; for example, all references to nickel–chromium–molybdenum steel will be found under the heading chromium–molybdenum–nickel steel. In the indexing of other alloys, carbon and iron, when present, are included in the title; iron, when present, is always mentioned first and the other elements follow in alphabetical order, carbon being in all cases mentioned last. Examples: "Iron–silicon–carbon alloys" and "iron–chromium–nickel–carbon alloys."]

Accles and Pollock, Ltd., small-diameter tube making, 292

Adhesion, chromium-plate, testing, 296; metallic, bonding comparisons with brazing and soldering, 295; nickel-plate peeling test, 295

Ageing, effects on anodic-surcharged steels, 299

Air, pollution bibliography, 207

Aircraft Parts, ceramic coatings, 196, 300; engine, spraying with Ni–MgO cermet, 95; finishing plant and methods, 93; press for, 91

Algeria, iron-ore deposits, 224

Algoma Steel Corp., sinter practice, 83

Allegheny Ludlum Steel Corp., extrusion press, 91; rare-earth additions to stainless steel, 200

Allied Ironfounders Companies, pipe spinning, 381

Allis-Chalmers Manufacturing Co., noise abatement, 102

Alloy Phases, binary interstitial solid solutions thermodynamics, 392; formation-heat calculation, 301

Alloy Steel, analysis by spot electrochemical tests, 303; creep tests, 97; properties, applications, and selection, 97; spectrographic line-pairs selection, 396

Alloy Structure, 98; dendritic growth, 393

Alloys, boron–chromium–nickel spray hard-face welding, 298; copper–lead powder for bearings, 386; copper–lead powders testing for bearings, 387; copper–magnesium, deoxidation with, 380; copper–nickel, thermal-conductivity lattice component, 96; copper–nickel–tungsten powders, 387; iron–aluminium, 200; iron–aluminium cold rolling, 382; iron–aluminium permeability increasing, 300; iron–aluminium–cobalt–copper–nickel magnetic orientation, 98; iron–aluminium–nickel single-crystal permanent-magnet properties, 393; iron–arsenic–carbon, 301; iron–boron constitution, 204; iron–carbon, austenite transformation in, 100; iron–carbon graphitization, 204; iron–carbon, hydrogen solubility in, 301; iron–carbon structural changes in tempering, 392; iron–carbon ternary diagram, 185; iron–cerium phase diagram, 393; iron–chromium tensile and impact properties, 163 (*Discussion*); iron–chromium–cobalt–nickel powders, 387; iron–cobalt–sulphur system, 394; iron–copper powder

Alloys—*Continued*
porosity, 386; iron–manganese, carbon solubility in, 39 (*Paper*); iron–molybdenum tensile and impact properties, 163 (*Discussion*); iron–molybdenum–nickel electrolytic preparation, 394; iron–nickel grain-growth study, 98; iron–nickel powder-compacts expansion study, 386; iron–nickel tensile and impact properties, 163 (*Discussion*); iron–nitrogen, effect of heat-treatment on brittleness, 163 (*Discussion*); iron–phosphorus, carbon solubility in, 39 (*Paper*); iron–silicon, α–γ transformation study, 98; iron–silicon, carbon solubility in, 39 (*Paper*); iron–silicon γ-loop, 100; iron–silicon permeability increasing, 300; iron–silicon, silicon activity in, 301; iron–silicon tensile and impact properties, 163 (*Discussion*); iron–silicon zeta-phase heat capacity, 394; iron–silicon–carbon, carbon activity coefficient in, 43 (*Paper*); iron–silicon–carbon, nodular-graphite formation in, 187; iron–silicon–carbon, silicon activity in, 301; iron–sulphur, carbon solubility in, 155 (*Paper*); iron–titanium–carbon graphitization, 100; iron–zinc, δ–ζ transformation, 101; lead–tin, removal from tinned iron, 94; nickel–tin plating, 395; nickel–tungsten powders, 387

Alumina, determination in steel, 396

Aluminium, bonding by Al-Fin process, 384; corrosion resistance as nitric acid container, 395; deformation in tension, 393; deoxidation reactions in liquid iron, 87; deoxidation of steel by, 381; determination in steel, 396; effect on desulphurization of carbon-saturated iron, 338 (*Paper*); effect on iron low-temperature properties, 200; effect of Zn on coatings on iron, 94; in heat-resisting clothing, 207; hot-dip coating, 384; powder sinterings, 387; vacuum deposition, 297

Aluminium Alloys, powder preparation, 387

Aluminium–Chromium Steels, prolonged-heating effects, 300

Aluminium–Manganese Steels, high-temperature oxidation, 390

Aluminium Nitride, determination in steel, 396

American Foundrymen's Association, gates and risers nomenclatures, 89

American Society for Metals, Committee reports, 200

Ammonia, in case-hardening atmosphere, 382; in heat-treatment atmospheres, 190; nitriding by, 191

Ammonium Sulphate, production-plant corrosion, 205

Analysis, 101, 206, 302, 395; colorimetric determination of Fe, Cu, and Ni in finishing effluents, 396; colorimetric reagents, 395; electrolytic determination of iron and iron oxides, 303; electrolytic, iron deposition in, 101; electrolytic spot, of alloy steels, 303; fluorescent X-ray spectrographic symposium, 102; magnetic, of iron-alloy phases, 100; photometric determination of silicon in small amounts, 302; photometric, of slags, 303; polarographic, in corrosion-kinetics study, 205; polarographic determination of chromium, 396; polarographic electrode - potentials calculation, 395; polarographic, of nickel-plating baths, 396; reagents for, 395; spectrochemical arc-striking delay, 396; spectrochemical electrodes for powders, 396; spectrographic A.C. arc source, 206; spectrographic determination of phosphorus in ore, 302; spectrographic index line and point determination, 302; spectrographic line-pairs selection, 396; spectrographic, sampling for, 396; spectrographic spark source, 302; spectrographic, of special-composition alloys, 302; spectrographic X-ray, symposium, 102; spectrophotometric determination of silicon, 302; spectroscopic direct-reader, 102; spectroscopic graphitization study, 396; X-ray fluorescent, symposium, 102

Analysis of, alloy steel by spot electrochemical tests, 303; cast iron, statistical study, 206; coal, 397; coke, 397; nickel-plating baths by polarography, 396; slags by photometry, 303; water and soils for corrosion activity, 205

Annealing, chromium plate, effects on structure and hardness, 296; dilatometric curves for irons, 187; effects on razor-blade steel, 300; malleable iron, 187; nodular-iron properties, 202; oxidizing, permeability increasing by, 300; sheet by cleaned producer gas, 189; white iron, effects of oxygne, 187

Annealing Furnaces, for cartridge cases, 291; control for high-speed steels, 90; electric, 91; natural-gas fired, 187; temperature-distribution determinations, 86; for wire, 191
Antimony, effect on liquid zinc attack on iron, 101
Appleby-Frodingham Steel Co., ironworks design and layout, 287; ironworks electrical supply and distribution, 287; ironworks gas and water services, 287; ironworks instrumentation, 287; "Operation Seraphim," 287
Arc Furnaces. *See* Electric Furnaces
Arc Welding. *See* Welding
Armco Steel Corp., precipitation-hardening stainless steels, 200
Armour Plate, welding, 193
Arsenic, effects on heated steel, 301; Fe–C system with, 301
Association des Industrials de Belgique, testing machine, 197
Associazione Italiana di Metallurgia, corrosion symposium, 205
Austenite, carbides formation in bainite transformation, 99, 393; decomposition in manganese steels, 99; grain-revelation method, 99; metastability in Cr–Ni steel, 230; residual, concentration changes, 393; retained, hardening by tempering, 204; stability in nickel steels, 393; transformation in bainite range, 99; transformation, effect of carbon, 99; transformation in Fe–C alloys, 100; transformation in pearlite, etc., stages, 99; transformation under tensile stress, 393
Australia, mining and metallurgy developments, 284
Automobile Industry, electroplating in, 296; steels for, 200
Automobile Parts, bumpers bright nickel plating, 296; fuel-pump rocker-arms hard facing, 298

Bainite, austenite transformation in range, 99; carbides formation in transformation, 204, 393; formation in heat-treatment, 189; formation under tensile stress, 393
Barrow Steel Works, Ltd., repeating hoop mill, 293
Batelle Memorial Institute, electric mild-steel report, 87; open-hearth and electric-furnace costs comparison, 185
Bearings, ball, steel testing, 197; copper–lead powders production for, 386; copper–lead powders testing for, 387; lubrication review, 383; plastic, friction characteristics, 383; plastic, in rolling mills, 293; powder-metal self-lubricating, 387; roller, hydrodynamic lubrication, 294; roller, lubrication, 294; steel, carbide inclusions in billets, 290; steel testing for, 197; taper-roller, in rolling mills, 92, 293, 294
Belgium, iron and steel industry, 207
Bend Tests, on enamelled sheet, 196; fracture, on bearing steel, 197; on nodular iron, 201; on wire, 298
Bessemer Converter. *See* Converters
Bessemer Gold Medal, award for 1955, 372
Bessemer Process, acid, duplexing with open-hearth, 173; acid, sulphur in, 380; basic, 87; basic, comparison with open-hearth, 289; basic, development in Europe, 380; basic, development in Germany, 380; basic, heat balance, 288; basic, introduction history in Germany, 397; basic, metalloids recovery in, 380; basic, possibilities, 288; basic, studies, 380; charge blowability, 86; effect of manganese in iron, 86; oxygen in, 380; oxygen top blowing, 184; oxygen top blowing by Demag lance, 184; oxygen top blowing by L.D. process, 87, 97; oxygen top blowing by L.D. process, U.S. prospects, 288; waste-gases study, 184; work of Tropenas, 102
Bessemer Steel, basic, in Europe, 380; basic free-cutting rimming, defects susceptibility, 380; basic oxygen-blown, 380; basic pearlite-free, fabrication and properties, 163 (*Discussion*); basic, quality, 87; ingot moulds for, 185; low-nitrogen production without oxygen blowing, 288; LD-type acceptance tests for shipbuilding, 97; LD-type properties, 97; LD-type properties and uses, 200; oxygen-blown, 86, 288, 380
Bethlehem Steel Co., bar/rod mill, 382; heating-furnace burners, 381
Biographies, *frontispiece,* also to face 104, 208, 304; contributors to *Journal,* 76, 175, 281, 374
Bituminous Coal Research, Inc., heat-extraction studies, 84
Blast-Furnace, 86, 183, 287, 379; bell design for distribution control, 287; carbon-hearth study by thermal model, 17 (*Paper*); charging system for flue-dust reduction, 379; design aspects, 287; early, restoration at Diosgyör, 303; engineering devices for, 183; large, at Westfalen, 86; low-shaft, 86; low-shaft research at Ougrée, 36 (*Paper*), 183; model hearth for thermal studies, 17 (*Paper*); model smelting trials at U.S. Bureau of Mines, 288; oxygen-enriched-air trials at Dilling, 288; oxygen-enriched-air trials at Moyeuvre, 287; performance in Czechoslovakia, 182; refractories, 379; tuyere-design effect on coke turbulence, 184; tuyere-design history, 183
Blast-Furnace Coke, properties, 85; properties effects on combustion, 183; reactions in furnace, 86; turbulence in hearth, 184
Blast-Furnace Plant, expansion at Fontana, 378; gas-turbine blowers, 293, 359 (*Paper*)
Blast-Furnace Practice, 86, 183, 287, 379; burden preparation in Lorraine, 183; conference, 176; pig-bed preparation by machine, 288; with sinter, 83, 181; with sinter/Lorraine-ore burden, 287; in U.S.A., 379
Blast-Furnace Process, bosh reactions, 380; CO catalytic decomposition, 288; coke combustion, 183; coke kinetics in turbulence zone, 184; coke reactions, 86; hearth reactions, 184; hearth thermal-model studies, 17 (*Paper*); metal/slag reactions, 288; ore-mining mechanization effects, 377; phosphorus behaviour, 380; reactions, 288; thermodynamic functions, 288
Blast-Furnace Slag, constitution, viscosity, and desulphurization mechanism, 183; granulated, production and properties, 183; pumice-type, for building, etc., uses, 183; reactions with metal, 288; sulphur combination and behaviour in, 86; utilization, 86; utilization in U.S.A., 86; wool production and properties, 183
Blast-Furnace Stoves, accumulation tests, 287; explosion in, 183
Boilers, corrosion prevention, 100; cracking in, 197; descaling by corrosion inhibitors, 205; gas exit-temperature measurement by suction pyrometer, 379; plate. *See* Steel Plate; pulverized-fuel-fired, precipitators, 182; tube and plate cracking, 197; waste-heat recovery, 271 (*Paper*); water specifications, 207
Book Notices, 102, 207, 303, 398
Boron, effects in Cr–Ni steels, 391; effects in vacuum-sintered metal powders, 386; removal in heat-treatment, 189
Boron–Chromium–Nickel Alloy, as spray-welded hard face, 298
Boron–Molybdenum Steel, weldability in relation to heat-affected zone, 193
Boron Steel, Fortiweld, 200, 201; production and properties, 200; research at I.R.S.I.D., 200; tests in Germany, 200
Brass, replacement by non-magnetic steel, 300
Brazil, iron and manganese ore deposits, 83; magnesite deposits, 377; open-hearth practice at Volta Redonda, 1 (*Paper*)
Breda Scientific Research Institute, corrosion research, 205
British Iron and Steel Research Association, automatic data handling by teleprinter technique, 358 (*Letter*); blast-furnace conference, 176; determination of silica in ores, slags, and refractories, 336 (*Paper*); die profiloscope, 192; oxygen-lancing method for steel production in ladle, 187; traffic conference, 207; vacuum-melting laboratory furnaces, 187
British Oxygen Co., Ltd., oxygen-production plant, 102
Brittle Fracture, initiation by dislocations, 299; of liberty ships, 388; microstructure relationship with, 98; mild-steel, notched-bar study, 197; of steel, 388; storage-tank studies, 197; testing by notched bar, 197
Brittleness, effect of heat-treatment of high-purity iron–nitrogen alloys, 163 (*Discussion*); hot, initiation by deoxidizing additions, 300; temper, in Cr–Mn steels, 198; temper, effect of temperature, 197; temper, hardness relationship with, 198; temper, in nodular and blackheart cast irons, 202
Calcium Carbide, injection in iron for desulphurization and preparatory spheroidization, 88
Canada, Labrador-Quebec iron-ore deposits, 181; Labrador-Quebec iron-ore deposits potentialities, 83; Labrador-Quebec iron-ore shipment to U.S.A., 377; metallurgical operations, 102; Quebec mineral resources, 284; research organization, 398

Cannons, early foundry practice in Italy, 397
Carbides, in Cr–Ni steel, 203; formation in bainite transformation, 204, 393; formation in chromium steel, 204; inclusion in bearing-steel billets, 290; suberitical decomposition in some low-carbon silicon steels, 249 (*Correspondence*)
Carbon, determination in trace amounts, 302; determination by volumetric method, 396; effect on Cr–Mo steel **S** curves, 99; effect on semi-killed hot-rolled steels, 97; effect on tungsten carbides containing cobalt, 387; engineering and metallurgical applications, 286; iron and nickel oxides reduction by, 183; martensite hardness as function of, 99; oxygen equilibrium with in liquid Fe, 99; precipitation from stored α-iron, 99; reaction with CO_2 in deep fuel beds, 285; solubility in iron–phosphorus, iron–silicon, and iron–manganese melts, 39 (*Paper*); solubility in iron–sulphur melts, 155 (*Paper*); vapour-phase replica for electron microscopy, 392. *See also* Refractory Materials
Carbon Dioxide, determination by volumetric method, 396; as machining coolant, 194; reaction with carbon in deep fuel beds, 285
Carbon Monoxide, decomposition by catalytic iron, 288, 379
Carburization, furnace for, 190; methods and mechanisms, 191
Carnegie-Illinois Steel Corp., blast-furnace design, 287
Carnegie Medal, award for 1954, 373
Cartridge Cases, annealing furnaces for, 291; from drawn powder compacts, 384; zinc plating, 195
Case Hardening, 190, 382; agents analysis, 191; dimensional changes in, 191; effects of ammonia and water vapour, 382; electric furnace for, 91; steels, dimensions and temperature effects, 96

Cast Iron, analysis statistical study, 206; annealing curves, 187; bonding with aluminium, 384; chromium, isothermal transformation diagrams, 204; corrosion in contact with copper, 101; corrosion by cutting fluids, 395; corrosion, effect of nickel, 206; dephosphorization, 380; determination of manganese in, 396; determination of silicon by spectrophotometry, 302; effects of elements, 201; effects of hydrogen, 200; elasticity relationship with microstructure, 202; etching for phosphorus in metallography, 392; gamma radiography, 199; graphite structure, 204; grey. *See* Grey Cast Iron; growth of, 203; hardness relationships, 198; hot tearing, 391; hydrogen solubility in, 390; impact properties, 391; magnetic and electrical properties, 202; martensitic, 198; metallography, 203; Ni-Resist, 391; nickel, properties and applications, 391; nickel-bearing, corrosion in soils, 206; nodular. *See* Nodular Cast Iron; oxygen in, 97; pipe spinning, 381; pipes centrifugal casting, 89, 188; pipes, soil corrosion-activity analysis, 205; production in induction furnaces, 187; rolls hardening, 189; rolls welding, 295; rolls review, 192; shrinkage and growth determination apparatus, 199; solidification, 291; solidification under centrifugal pressure, 291; toughness-tests results, 201; white. *See* White Cast Iron

Cast Steel, thermit process, 381

Casting, centrifugal. *See* Centrifugal Casting; chill, of steel plate, 89; continuous. *See* Continuous Casting; die, of cast-iron gutters, 291; feeder-heads heating by exothermic materials, 187, 188; feeder-heads size calculation, 188; feeding-systems metal flow, 185; fluid flow, 188; investment. *See* Investment Casting; pouring-rate determination by layer method, 381; precision. *See* Precision Casting; pressure, of wheels, 187; refractories wear in, 379; temperature effect on chilling and mottling, 186; thermit process, 381

Castings, bath, cracking in, 188; chilling and mottling, 186; cleaning by corrosion inhibitors, 205; cooling-rate sectional effects, 391; defects, mould factors in, 188; grey-iron. *See* Grey-Iron Castings; gutter, production by die pressing, 291; malleable-iron. *See* Malleable-Iron Castings; nodular-iron, 89, 187; risering for nodular iron, 89; risers nomenclature, 89; rising speed, 381; solidification, 188; solidification, length changes in, 188; steel. *See* Steel Castings; surface-finish factors, 381

Castings, Ltd., plant and practice, 187

Cathodic Protection, cells and mechanism, 196; economics, 205; electrolytic-damage prevention in adjacent structures, 205; instrumentation for, 394; of internal surfaces, 302; polar organics action in, 101; of power-station intakes and condensers, 205; practice, 302; principles and applications, 302; review, 205; ships, 100; ships and marine structures, 100; test-methods, 394; by zinc-rich paint, 94

Cementation, equipment for, 190

Cementite, effect of cold work, 392

Centrifugal Casting, horizontal machine for pipes, 89; machine for cast-iron pipes, 188; pipes, 291; principles and limitations, 381

Chain, production and maintenance, 193; welding by hydrogen process, 193

Chemical Research Laboratory, corrosion research, 205

Chi Phase, in Fe–Cr–Mo, 301; in Ti-modified Cr–Mo steel, 393

Chlorine, corrosion by, 395

Chromatography, H_2SO_4 separation by for S determination, 206

Chromite, Turkish deposits, 284

Chromium, determination by polarography, 396; effect on non-metallic inclusions, 290

Chromium Carbide, hard facing by, 195; in hard-metal allovs, 387

Chromium–Manganese Steel, case-hardening, properties, 96; comparison with Cr–Ni steels, 97; sigma-phase relationship with cold work and recrystallization, 392; temper brittleness, 198

Chromium – Manganese – Molybdenum – Nickel Steel, 97

Chromium–Manganese–Nickel Steel, 97; nitrogen-containing, 393

Chromium–Molybdenum Steel, CD4 type study, 99; carbon effect on **S** curves, 99; chi and Laves phases in Ti-modified, 393; creep-rupture data, 320 (*Paper*); hydrogen embrittlement, 391

Chromium – Molybdenum – Nickel Steel, tubes nitriding with high-pressure N, 191

Chromium–Nickel Plating, corrosion of, 395; plant, 94; weathering, 296

Chromium–Nickel Steel, austenite metastability in, 230 (*Paper*); carbides in, 203; case-hardening, properties, 96; comparison with Cr–Mn steels, 97; corrosion by chlorine, 395; effects of boron, 391; heat-resisting castings, 300; intercrystalline corrosion, 394; notch-impact toughness, 197; passivity in H_2SO_4, 100; sigma-phase identification, 392; sigma-phase relationship with cold work and recrystallization, 392; X-ray diffraction high-temperature examination, 240 (*Appendix*)

Chromium Plating, adhesion test, 296; annealing effects, 296; cutting tools, 195; hard, stop-offs in, 94

Chromium-Plating Solutions, chromium sulphate complex formation, 296

Chromium Steel, carbide-forming behaviour, 204; cast, effects of elements, 201; cold-treatment, 292; creep/tempering relationships, 382; die, effects of V and Mn, 200; fatigue-strength relationship with inclusions, 388; prolonged-heating effects, 300; sigma-phase identification, 392; tempering effect on corrosion resistance, 394

Chromizing, gaseous, 296; for wear protection, 195

Clad Metals, Al-Fin process, 384

Clad Steel, stainless on low-carbon, 201

Cleaning, 93, 194, 295, 383; by corrosion inhibitors, 205; electrolytic, 295; handbook on, 194; for nickel plating, 295; radio-isotope study, 295; shot blasting. *See* Shot Blasting; ultrasonic, 93

Coal, analysis developments, 397; aromatic and volatile matters, 85; blending and grinding, 85; calorific value, 85; classification, 285; classifier for, 285; cleaning in Britain, 378; coking blends, 85; coking in Czechoslovakia 182; coking at Fontana, 378; coking with iron ore, 182; coking, low-temperature evaluation apparatus, 286; coking, low-temperature techniques, 286; coking, oil addition to blend, 85; coking-pressure evaluation, 286; coking-properties index, 286; coking research at Marienau, 286; coking test, 378; crushing, 378; determination of sulphur in, 206; dewatering, 285; dewatering of slimes, 285; dust reduction in mining by wetting, 285; fine-middlings separation in sink classifier, 285; fines ash-content reduction by wet process, 285; fines preparation in centrifugal separator, 285; fines preparation in cyclones, 285; flotation, 85, 285, 378; heat-extraction research, 84; oxidation effects on flotation properties, 85; phosphorus reduction

Coal—*Continued*
in, 378, plasticity representation, 286; pore structure, 85; preparation conference, 285; preparation for coking, 85; preparation economics, 285; preparation plant, 182; preparation supervision, 285; preparation-yield determination, 285; pulverized, gasification, 286; replacement by liquid fuel, 182; slimes classification and dewatering, 285; softening tester, 85; storage for spontaneous ignition prevention, 285; treatment by nitrogen oxides, 85; washing plant in India, 85; washing trials, 285

Coatings, asphalt-mastic, 298; ceramic, 95; ceramic A-418 type, 95; ceramic, for aircraft parts, 196, 300; ceramic, corrosion protection by, 205; ceramic, effect on fatigue strength, 299; ceramic, electrical resistivity, 196; ceramic, for jet-engine parts, 196; ceramic, laboratory assessment, 196; ceramic, processing, 196; ceramic, selection, 196; ceramic, symposium, 196; ceramic, use, 196; corrosion at gaps, 302; electrodeposited. *See* Electrodeposited Coatings; enamel. *See* Enamels; Fe–Al, effect of Zn, 94; paint. *See* Paints; phosphate. *See* Phosphate Coatings; protective, 93, 194, 296, 384; protective against HCl, 93; protective anti-oxidant, 100; protective for ships, 101; sprayed, impregnation and organic finishing, 95; sprayed, porosity, 95; tin, 94; vapour-phase, 384; vapour-phase Al, 297; vapour-phase in finishing, 297; vapour-phase, stress, 296; vapour-phase, thickness determination, 296; vinyl, 101

Cobalt, determination in presence of Fe and Cu, 396

Cobalt Alloys, hard facing by, 195

Coke, analysis developments, 397; blast-furnace, properties, 85; blast-furnace, properties effects on combustion, 183; blast-furnace, reactions, 86; blast-furnace, turbulence in hearth, 184; crushing, 378; cupola high-carbon, 88; high-carbon type, 88; from iron-ore/coal mixtures, 182; reactivity study, 378; reduction of iron oxides by, 30 (*Paper*), 283 (*Corrigendum*); sizing, 182; in U.S.A., 379; volatile matter, 85

Coke-Oven Plant, Alkali Act aspects, 85; collecting-main pressure effects, 286; expansion at Fontana, 378

Coke Ovens, coal-pressure evaluation in, 286; effect of collecting-main pressure on life, 286; heating-up on starting, 85

Cold Drawing, Flowturn process, 292; flow-turning machines, 194; of hot-rolled sections, 191

Cold Heading, advantages, 191; design in, 292

Cold Rolling, effects on razor-blade steels, 300; of Fe–Al alloy, 382; recrystallization effects in, 204; sheet practice, 92; strip, graphical representations, 293; techniques, 382

Cold Treatment, 292; hardening by, 189

Cold Working, effect on cementite, 392; hardening by, 388; internal-energy evolution in, 197; micro surface cracking in, 93; sigma-phase relationship with, 392; X-ray line broadening by, 393

Colorimetric Analysis, determination of Fe, Cu, and Ni in finishing effluents, 396; reagents for, 395

Colvilles, Ltd., bogie-shunting crane, 383

Communications, television in, 207

Companhia Siderúrgica Nacional, open-hearth practice at Volta Redonda, 1 (*Paper*)

Concrete, prestressed, reinforcing-wire tension testers, 299

Consett Iron Co., Ltd., acid-converter/open-hearth duplexing, 173; electrical developments 174; electrical maintenance, 174; ore discharging and handling plant, 174, 377; power-

Consett Iron Co., Ltd.,—*Continued*
station operation, 174; slabbing/blooming and continuous billet mills, 173, 174
Continental Steel Corp., rod mill, 293
Continuous Casting, literature review, 87, 290; principles, 87; techniques, 188
Converters, basic, design and construction, 289; dolomite plant for, 286; oxygen in, 380; oxygen top blowing, 184; oxygen top blowing in Demag type, 184; oxygen top blowing by L.D. process, 87, 97, 288; side-blown Tropenas, development, 102; slag as fertilizer, 380; tar for, 86; tar/dolomite bottoms preparation, 380; tar/dolomite linings, 184
Conveyors, belts repair and maintenance, 92; in plating and enamelling shops, 296
Cooling, continuous, effect of hydrogen, 353 (*Discussion*); continuous, transformation diagrams, 353 (*Discussion*); continuous, transformations recorder, 394; cracking in white iron, 188; effect on grey iron, 90; effect on impact transition temperatures, 97; effect on martensite transformation, 393; ingots, 87; ingots between teeming and stripping, 132 (*Paper*); sectional effects in castings, 391
Copper, corrosion by alkali chlorides, 394; corrosion in contact with cast iron, 101; determination in finishing effluents, 396; effects in grey iron, 201; effects in nodular-graphite formation, 201; powder-compacts fatigue properties, 386; powder pressing characteristics, 385
Copper–Lead Alloys, powders for bearings, 386; powders testing for bearings, 387
Copper–Magnesium Alloys, deoxidation with, 380
Copper–Nickel Alloys, lattice component of thermal conductivity, 96
Copper–Nickel–Tungsten Alloys, powder metallurgy, 387
Cores, binding by synthetic resins, 89; blowing, 89; dry-sand, metal penetration, 89
Corrigendum, news section, 78
Corrosion, 100, 205, 301, 394; by alkali chlorides, 394; in ammonium sulphate production, 205; bacterial, 394; boiler-fittings, inhibition, 100; in chemical industry, 205; by chlorine, 395; chromium–nickel coatings, 395; at coating gaps, 302; by cutting oils, 395; design for prevention, 205; determination by ultrasonics, 302; electrochemical irreversible processes, 101; electrolytic, of iron and copper, 101; filiform, mechanism, 101; by fluoride solutions, 100; fretting, effect on fatigue strength, 101; fretting, effect of lubricants, 101; fretting, inhibition by molybdenum disulphide, 193; fretting study, 395; fretting, symposium, 101, fretting, test equipment, 101; in fused carnallite, 395; in heating pipes, 205; in hot-water piping, 101; indicating instruments for pipelines, 101; inhibition and activation concepts, 301; inhibition by amines, 100; inhibition determination by polarization curves, 205; inhibition by inorganics, 205; inhibition in nitric acid, 395; inhibition by polar organic compounds, 101; inhibition by Saran, 195; inhibition by sodium chromate in antifreeze solution, 395; inhibition by sodium hydroxide, 206; inhibition by sodium metaphosphate glass, 395; inhibition in sulphuric acid by diethylaniline, 93; inhibition by vapour-phase compounds, 205; inhibitors, 205; inhibitors in boiler descaling, 205; inhibitors in castings cleaning, 205; inhibitors research, 205; inhibitors testing for oil and gas wells, 101; intercrystalline, of Cr–Ni steels, 394; intercrystalline, testing by sound, 205; iron/copper joints, 101; iron by sulphur, 100; kinetics study by polarography, 205; mechanism, 100; microstructure effects, 98; nickel-tin coatings, 395; in oil refineries, 205; oil refineries inspection for, 206; oil refineries by water, 206; *p*H correction for, 206; passivation by oxidizing agents, 205; passivation phenomena, 205; passivity mechanisms, 100; in petro-chemical industries, 394; pipeline, soil-activity analysis, 205; protection by ceramic coatings, 205; protection by painting, 195; protection by phosphate coatings, 205; protection research, 205; protection of ships and marine installations, 101; protection by spray packaging, 296; protection theory and practice, 205; protection by tin, 205; protective painting, 196; protective paints for ships, 394; protective-pigments testing, 205; in pumps, 395; research at Chemical Research Laboratory, 205; research in Italy, 205; resistant materials, 205; rust. *See* Rust; sea-water, measurement by electrode potentials, 101; sea-water, tests of protective coatings, 101; ship machinery, 100; soil, 205; soil analysis for active agents, 205; soil, Fe/Pb electrodes double-layer formation, 394; soil-moisture effects, 394; soil, of Ni-bearing cast irons, 206; soil, of pipe materials, 302; solution-pressure changes, 301; stainless steel, dissolved-gases effect on pitting, 205; stainless steel intercrystalline testing by sound, 205; stainless steel passivity, 205; standards for in Italy, 205; stress cracking, effect of stress relief of weldments, 206; stress cracking of mild steel, 101; by sulphur, 100; symposium, 205; test-methods, 205; testing, electrochemical methods, 205; testing by nitric acid, error source in, 206; testing without products removal, 395; tests on Cr–Ni and Ni–Sn coatings, 395; tests reproducibility, 301; tin-coated iron, 94; by vanadium oxide ash, 206, 394; by vanadium oxide ash, effect of gas-turbine alloy composition, 241 (*Paper*); by vanadium oxide, attack mechanism, 342 (*Paper*); by water, 205; water analysis for activity, 205; water, prevention in oil refineries, 206; in welding, 395; zinc passivity in relation to aeration, 205
Corrosion Cracking, effect of tempering of 12% Cr steels, 394; stress, effect of stress relief of weldments, 206; stress, of mild steel, 101
Corrosion Resistance, chromium steels in acid, 206; effect of tempering, 394
Cracks, in bath castings, 188; boiler, 197; cooling, in white iron, 188; corrosion. *See* Corrosion Cracking; detection by eddy currents, 389; detection by magnetics, 388; detection by magneto-induction, 389; detection by ultrasonics, 96; hair-line, in H.F. melted Inconel, 317 (*Paper*); in ingots for fine-grained steel, 290; micro surface in working, 93; in nickel plate, 296; radiographic vizualization, 389; temperature-change effects, 197; weld, hot testing, 194; welding, effect of hydrogen, 92; welding, susceptibility test, 193
Cranes, cab and pulpit air conditioning 193; diesel-electric bogie-shunting, 383; electrical equipment for bridges, 383; forge, 193; hook-block safety stop, 193; hooks and hangers fracture, 197; power-limit switches, 193; revolving, for foundry, 92
Crankshafts, nodular-iron, 88
Creep, of cermets, 387; in intermittent stress, 97; of molybdenum steels, 320 (*Paper*); nodular iron, 390; of refractory metals, 199; relationships with tensile properties of a commercial alloy, 105 (*Paper*); rupture properties and structural effects, 300; of steam-pipe steels, 390; stress effects in gas-turbine rotors, 390; temperature relationships, 382; thermal-stress, 199; of titanium carbide base materials, 387; variable-strength causes in basic open-hearth steel, 211 (*Paper*)
Creep Tests, data interpretation, 95; long-term, on low-alloy steels, 97; machine for, 95
Crystallography, domain structure of ferromagnetic metals, 203; geometrical basis of crystal chemistry, 393; metal intercrystalline mutations in relation to viscosity, 185; metal-lattice thermal-conductivity component, 96
Cupola, acid, melting variables, 88; blast-preheating recuperator, 186; borings and turnings melting in, 186; coke, high-carbon type, 88; continuous-flow type, 186; developments review, 186; duplexing with air furnace, 88; duplexing with reverberatory furnace for malleable iron, 186; dust collection by water spray, 88; engineering devices for, 183; gas-cleaning study, 188; for grey-iron castings, 186; hearth-heat supply by carbon arcs, 186; hot-blast, 186; nodular-iron production in from magnesium alloys, 88; oil-fired, 291; practice, 186; remelting effects on iron, 291; water-cooled, 186
Cutting, by carbon arc, 295; flame. *See* Flame Cutting; lubricants in corrosion, 395; lubricants recovery, 93
Cutting Tools, chromium plating, 195; for peeling shafts, 194
Cyanides, wastes disposal, 194
Czechoslovakia, coke and pig-iron production, 182; metallurgical institute at Ljubljana, 398; open-hearth control by Russian instruments, 184

Damping, static-stress effects, 391
Decarburization, of iron powders, 298; temperature effect on rate, 298
Dechema-Werkstoff-Tabelle, 102 (*Book*)
Deep Drawing, comparison with metal spinning, 91; Hydroform process, 91; sheet-steel properties, 170 (*Discussion*); springback in, 91
Deformation, dislocations climb in f.c.c. crystals, 203; dislocations and fracture, 299; dislocations interactions, 98; dislocations and mechanical properties, 204; dislocations relationships with grain boundaries, 203; dislocations in single crystals, 203; effects on recrystallization, 392; iron crystals by unidirectional abrasion, 124 (*Paper*); martensite-transformation effects, 393; plastic, density decrease of nodular iron during, 202; plastic, of iron and iron powders, 388; plastic, results evaluation, 191; plastic, stress analysis during, 96; plastic, in working, 93; slip-band formation on surfaces, 387; slip process at yield point, 299; slip and shear, 197; in stainless steels, 299
Degreasing, electrolytic, in de-rusting process, 205
Deoxidation, with Cu–Mg alloy, 380; hot-brittleness initiation in, 300; iron by aluminium, 87; steel by aluminium, 381
Dephosphorization, of iron, 380
Deritend Precision Castings, Ltd., investment-casting plant, 291
Dermatitis, prevention in foundry, 381
Derustit, Ltd., de-rusting process, 205
Descaling, boilers by corrosion inhibitors, 205; by high-pressure water, 293; machine for billets, 185; rods for wire-drawing, 194; by temper mill, 192
Desulphurization, blast-furnace-slag mechanism, 183; of carbon-saturated iron, 338 (*Paper*); iron by calcium carbide, 88; pig iron by sodium carbonate, 379

Detroit Steel Corp., power system, 192
Diamond Dies, profiloscope, 192
Diamonds, bit action in drilling, 284; bit, cube orientation in, 284
Die Casting, of cast-iron gutters, 291
Dies, diamond, profiloscope, 192; drawing, bearing-length measurement, 192; steel, 200; wire-drawing, profiloscope, 192; wire-drawing, research review, 92
Diesel Engines, bogie-shunting crane, 383; in shunting, 193
Diffusion, nitrogen in iron, 350 (*Discussion*)
Dolomite. *See* Refractory Materials
Dominion Foundry and Steel Co., oxygen top blowing in converter, 184
Dominion Steel and Coal Co., blast-furnace-slag utilization, 86; Wabana ore deposits, 181
Dorman Long and Co., Ltd., Lackenby steelworks, 288; pig-bed preparation by machine, 288
Drawing, 91, 191, 292, 382; cold, Flowturn process, 292; cold, flow-turning machines, 194; cold, of hot-rolled sections, 191; cold, rolling in preparation, 191; die bearing-length measurement, 192; powder compacts, 384; springback in, 91; stretch-forming curved-jaw machine, 191; stretch forming by radial technique, 292; tapered shells, 191
Ductility, effect of hydrogen, 199; of white-heart malleable, 201
Duplexing, acid - converter / open - hearth, 173; cupola/air-furnace, 88; cupola/reverberatory-furnace, for malleable iron, 186
Dust, flue, electrostatic precipitation, 85; foundry control, 291; precipitation from iron oxide fumes, 183; precipitators for boilers, 182

Eaton Manufacturing Co., machining-wastes recovery, 93
Economics and Statistics, 102, 206, 397; basic-point pricing in U.S. iron and steel industry, 304 (*Book*); galvanizing costing, 297; plating-plant depreciation determination, 296
Edison (T. A.), taconite-beneficiation work, 285
Elasticity, cast iron, 202; grey iron, 201; hardened steels, 387; theory equations in cylindrical co-ordinates, 96
Electric Furnaces, arc basic, lining with prefabricated sections, 290; arc laboratory type, 202; arc, linings, 290; arc, optimum-current determination, 185; controlled-atmosphere, 91; costs comparison with open-hearth, 185; design, 87; Héroult, energy consumption, 290; induction, cast-iron production in, 187; lining with aluminosilicate mix, 185; lining with prefabricated sections, 290; linings, 290; mild-steel production in, 87; in Peru, 288; pig-iron production in, 183, 288, 379; refractory mix, 185; single- and three-phase types comparisons, 290; vacuum-melting laboratory-types, 187
Electric Steel, mild, 87
Electrical Equipment, at Appleby-Frodingham, 287; auxiliary-motors standardization, 294, 383; brass parts replacement by manganese steel, 300; at Consett, 174; crane-bridge, 383; crane power-limit switches, 193; electroplating-rectifiers output fluctuations, 296; maintenance at Consett, 174; ore-grinding motors, 285; rolling-mill drive breakdowns, 293; rolling-mill drive at Fairless, 92; rolling-mill drives, 292, 382; steelworks, 192
Electrical Power, in iron and steel works, 85; plant cathodic protection, 205; plant efficiency increasing, 92; plant and practice at Consett, 174; tariff in Yorkshire, 279 (*Appendix*); waste-heat recovery in generation, 271 (*Paper*)
Electrical Properties, cast iron, 202; comparator for, 389; of iron grid materials, 300
Electrical Resistance, of porcelain enamels, 196; of silicone coatings, 196; of slags, 290
Electrical Testing, eddy-current methods, 389; electro-acoustic methods, 389; methods, 388
Electrodeposited Coatings, properties, 196; surface-roughness measurement, 93; tin-alloy. *See also* Electroplating
Electrolytic Analysis, determination of iron and iron oxides, 303; iron deposition in, 101; spot, of alloy steels, 303
Electrolytic Degreasing, in de-rusting process, 205
Electrolytic Polishing, 383; bibliography, 194; heat-evolution study, 202; process and applications, 295; theoretical study, 93
Electron Diffraction, applications and limitations, 392; camera for, 393
Electron Microscope, diffraction focusing, 98; diffraction-grating copies for calibration, 98; hardenability/structure study, 393; iron-oxidation study, 302; iron and steel structures study, 202; at Metallografiska Institutet, 202; in metallography, 98, 202; permanent-magnet structure study, 98; replication by vapour-phase carbon, 392
Electronics, measurement by, 207; testing by, 388
Electroplating, automobile parts, 296; bright, 383; conveyors for parts, 296; electrode-polarization determination, 296; before galvanizing, 195; in Italy, 296; plant depreciation calculation, 296; plastics applications in, 296; principles and practice, 195; radio-isotope study of partial intensity in, 296; rectifiers output fluctuations, 296. *See also* Electrodeposited Coatings
Electroplating Solutions, for barrel plating, 296; thermostatic control, 296; waste, disposal and reclamation, 296; waste, treatment, 296
Embrittlement, caustic, of mild steel, 101; hydrogen. *See* Hydrogen Embrittlement; temper. *See* Temper Brittleness
Emission Microscope, grain-growth study by, 98
Enamelling, conveyors for parts, 296; of metal furniture, 297; vitreous, temperature controller, 182
Enamels, base, for steels, 94; developments, 94; hairlining in, 94; porcelain, abrasion resistance, 196; porcelain, abrasion testing, 196; porcelain, acid resistance, 196; porcelain, fatigue-strength effect, 299; porcelain, selection, 196; porcelain, strengthening effect on sheet iron, 196; porcelain, symposium, 196; porcelain, torsion testing, 196; porcelain, use, 196; porcelain, weathering resistance, 196; single-coat white, 95, 196; titania-opacified, colours stability, 95; vitreous, defects on iron castings, 298; vitreous, flexure and fracture, 94; vitreous, reboiling in, 95; vitreous, as stress indicators, 95
Engineering, buyer's guide, 398 (*Book*); Kempe's yearbook, 399 (*Book*)
Erie Mining Co., ore plant, 397
Extrusion, cold, 91; cold, of shells, 91; developments, 191; jet-engine rings, 191; press for tubes, 91; straightening equipment, 191

Fatigue, effect of ceramic and enamel coatings, 299; effect of fretting corrosion, 101; effect of grinding, 388; effect of residual stresses, 197, 388; effect of shot peening, 197; effect of surface preparation, 299; effect of understressing, 197, 299; failure theory, 96; inclusions relationships, 388; shock, 92; statistical-approach symposium, 197; stress relationship with, 95; thermal cyclic-stress effects, 390
Fatigue Strength, copper-powder compacts, 386; forgings statistical study, 197; grey-iron, effect of graphite flake size, 97; pearlitic and spheroidite steels, 391; screw threads, 299; weld, effect of thermal activation, 295; welded structures, 388
Fatigue Tests, effect of cyclic speed, 390; effect of specimen size, 197; fixtures for, 299; machine, 96; progressive-load, 96; Prot-type, 96; Prot, in understressing study, 299; rapid routine, 96
Fayalite, inclusions in iron, 162; synthetic study, 285
Federated Foundries, Ltd., gutter production by die casting, 291
Ferrites, effect of Al, 200
Ferro-Alloys, production, 185; sampling, 185
Ferromagnetic Alloys, structure and coercivity, 98
Ferromagnetism, domains structure, 203
Ferromanganese, determination of carbon in, 396
Ferrosilicon-Magnesium Alloys, nodular-iron production from, 88
Fertilizers, basic Bessemer slag, 380; slag action, 183
Films, formation by alkali bluing, 384; vapour-phase, 384; vapour-phase aluminium, 297; vapour-phase carbon in electron microscopy, 392; vapour-phase in finishing, 297; vapour-phase, stress, 296; vapour-phase, thickness determination, 296
Finishing, barrel, of accounting-machine parts, 295; determination of Fe, Cu, and Ni in effluents, 396; handbook on, 194; powder parts, 384; practice, 93, problems, 296
Finland, mineral resources, 181
Flame Cutting, 92, 193, 294, 383; gases consumption in, 295; magnetic and electronic control, 295; powder, 295; study, 295
Flame Hardening, forgings, 190; stress initiation by, 190
Flame Propagation, theory, 378
Flame Radiation, international research laboratory, 84; trials in Holland, 182, 378
Flames, configuration in stability experiments, 84; diffusion, extinction theory, 84; emission and absorption in, 84; hydrocarbon, infra-red spectra, 84 hydrogen/fluorine, temperature, 84 hydrogen reactions in, 84; low-pressure, spectroscopic study, 84; oxy-acetylene. *See* Oxy-Acetylene Flames; reactions mechanism, 84; spectra studies, 84; spectra of turbulent and laminar types, 84; theory of, 84
Fluid Flow, measurement by transmitter 182
Fluidization, 103 (*Book*); technique and application, 377
Fluorides, corrosion by, 100
Ford Motor Co., soaking pits, 189
Forging, 91, 191, 292, 382; die, precision-limiting factors, 292; effects of Mn and S in, 292; ingot heterogeneity for, 87; ingot practice for, 87; jet-engine parts, 91; methods and machines, 292
Forging Furnaces, 189; heat indices, 90; rotary-hearth, 90
Forging Plant, 292; for bars, 292; cranes and manipulators, 193; heavy press for aircraft parts, 91; hydraulic-press accumulators, 292; hydraulic press for aircraft parts, 91; hydraulic press drive, 91; hydraulic-press oils, 292; hydraulic-presses control, 292; manipulator, 91; press safety devices, 382
Forgings, fatigue statistical study, 197; flame hardening, 190; properties dependence on local strain, 250 (*Paper*); testing by ultrasonics, 198
Foundry, blacking volatile-matter determination, 397; cannon, early practice in Italy, 397; crane for, 92; dermatitis prevention in, 381; drying stoves, 89;

Foundry—*Continued*
dust control, 291; immersion pyrometer, 286; noise, ventilation, lighting, etc., aspects, 188; productivity in, 188; research in France, 291; time study, 89; U.S. layouts and conditions, 90
Foundry Plants, Castings, Ltd., 187
Foundry Practice, 88, 185, 291, 381; for amateurs, 398 (*Book*); review, 186
Foundry Sand. *See* Moulding Sand
Fracture, bending test for, 197; brittle, initiation by dislocations, 299; brittle, of liberty ships, 388; brittle, microstructure relationship with, 98; brittle, of mild steel, 197; brittle, of steel, 388; brittle, of storage tanks, 197; brittle, testing by notched bar, 197
France, foundry research institute, 291; fuel and ore transport costs in Lorraine, 206; iron-ore deposits, 284; iron-ore production data, 284; mineral resources of Vosges-Ardennes, 181; units study, 398; working-hours regulation, 207
Friction, internal, measuring apparatus, 299
Fuel, combustion-oxygen controllers, 378; determination of volatile matter in, 397; economy in heating steel, 189; gasification, 182; liquid, coal replacement by, 182; liquid, flow-measuring transmitter, 182; liquid, stability in storage, 182; preparation, properties, and uses, 84, 182, 285, 378; technology in iron and steel making, 378; transport costs in Lorraine, 206
Furnaces, air preheaters, 378; air, refractories life relationship with temperature, 88; annealing, for cartridge cases, 291; annealing, control, 90; annealing, electric, 91; annealing, natural-gas fired, 187; annealing, temperature distribution, 86; annealing, for wire, 191; blast. *See* Blast-Furnace; carburization, 190; electric. *See* Electric Furnaces; enamelling, temperature controller, 182; forging. *See* Forging Furnaces; for galvanizing, 297; heat-treatment. *See* Heat-Treatment Furnaces; heating. *See* Heating Furnaces; induction. *See* Induction Furnaces; laboratory arc melting, 202; laboratory vacuum-melting, 187; open-hearth. *See* Open-Hearth Furnace; recuperators for, 285; reheating. *See* Reheating Furnaces; reverberatory, iron melting in, 88; vacuum-melting, at B.I.S.R.A., 187

Galvanized Steel, aftertreatments, 297; flaws in, 297; inspection, 297
Galvanizing, 196; bath heating factors, 297; coatings-uniformity testing by copper sulphate, 297; continuous line for strip, 94; continuous, in U.S.A., 297; costing in, 297; "curtain" formation in, 94; domestic utensils, 296; electroplating before, 195; flash-like defects in, 94; furnace for, 297; hot-dip, conference, 297; hot-dip, dross formation in, 297; kettle-heating methods, 94, 296; paint, 94; railway wagons, 297; Sendzimir, of strip, 94; threaded parts, 297; tube uses, 297; of tubes, 297; tubes pretreatment for, 297; wire, baths compositions, 297; wire, continuous process, 297; wire, frames for, 296; zinc-impurities effects, 296
Gas, analysis apparatus, 397; converter study, 184; cupola, cleaning, 188; determination of hydrogen in by continuous recorder, 396; determination in liquid metals, 188; diatomic, infra-red emissivity, 84; effects in metals, 390; energy-transfer symposium, 84; flame-spectra studies, 84; flow-rate determination by Pitot tube, 397; infra-red spectra, 84; iron and steel industry considerations, 182;
Gas—*Continued*
natural, annealing-furnace firing by, 187; producer. *See* Producer Gas; sulphur partition in in iron and steel making, 147 (*Paper*); temperature, astrophysical concepts, 84; temperature measurement by suction pyrometer, 379; turbulence effect on heat transfer, 84
Gas Holders, for steelworks, 286
Gas Producers, modern types, 378; Panindco, 286; pulverized-coal trials in, 286; two-stage, 286
Gas Turbines, alloy steels for, 199; blades from stainless steel powders, 386; blade steels, 300; for blast-furnace blowers, 293, 359 (*Paper*); corrosion by V_2O_5 in, 206, 394; corrosion by V_2O_5, attack mechanism, 342 (*Paper*); corrosion by V_2O_5, effect of alloy composition, 241 (*Paper*); heat-resisting alloys composition effects in scaling and V_2O_5 attack, 241 (*Paper*); industrial applications, 293; for power generation, 293; rotor welds testing by X-rays, 389; rotors creep-stress effects, 390
Gating, liquid flow in, 188; nomenclature, 89
Gauges, strain. *See* Strain Gauges
Gears, induction hardening, 90; lubrication, 193
Geiger Counter, X-ray diffractometer, 203
General Electric Co., waste-liquors treatment, 383
General Motors Corp., metal sorter, 199; scrap balers, 92
Germany, basic Bessemer process in, 380; basic Bessemer process introduction history, 397; boron-steel research, 200; iron industry in eastern zone, 397; pyrometers standardization, 182; Salzgitter steelworks revival, 397
Glass, fused-coating chemical resistance on steel, 196
Grain Boundaries, defects effects, 98; dislocations effects, 203; effects on properties, 98; migration inhibition by impurities, 203
Grain-Size, effect of oxygen, 301; growth mechanism in steel, 99; growth observation in emission microscope, 98; growth in powder-metal sintering, 385; hardness relationship with, 198; measurement methods, 202
Graphite, flake-size effects on grey-iron properties, 97; formation on surface during heat-treatment, 390; nodular, effect of Cu on formation, 201; nodular, effect in malleable iron, 391; nodular formation, 186; nodular formation in Fe–Si–C alloys, 187; nodular, metal surface-tension effects on formation, 187; nodular, production by Ca_2Si inoculation, 291; nodular structure, 203; nucleation and growth in steel, 203; solubility in liquid iron, 301; structure in cast iron, 204
Graphitization, effect of nitrogen, 390; of Fe–C alloys, 204; of Fe–Ti–C alloys, 100; of quenched and tempered nodular iron, 392; spectroscopic study of influencing elements, 396; steel at subcritical temperatures, 319 (*Correspondence*); in weld heat-affected zone, 93
Great Britain, steel-production data, 102
Great Lakes Steel Corp., rolling practice, 92; slabbing mill, 192
Grey Cast Iron, cooling effects, 90; effects of copper, 201; elastic modulus, 201; fluidity test, 89; graphite-flake size effects on properties, 97; manganese sulphide inclusions, 188; properties relationship with Brinell hardness, 200; silicate-inclusions effects, 201; standardization in Sweden, 97
Grey-Iron Castings, composition and cost factors, 186; test-bar correlations, 291
Grinding, cooling by twin-fluid process, 194; effect on fatigue, 388
Gun Tubes, heat-treatment equipment, 90; materials history in U.S.A., 102

Hadfield Medal, award for 1955, 372
Hair-Line Cracks, in H.F. melted Inconel, 317 (*Paper*)
Harbison-Walker Refractories Co., silica-brick making, 86
Hard Facing, alloys classification for, 195; with chromium carbide, 195; with cobalt-base alloys, 195; fuel-pump rocker arms, 298; for hot wear resistance, 194; nickel alloys for, 195, 298; rails, 193; with spray-welded B–Cr–Ni, 298; by tungsten carbide granules, 194; welding, 194; welding Plurial process, 294
Hardenability, atlas of, 398 (*Book*); effect of oxygen, 301; microstructure relationships, 393; steels classification by, 300; testing with eccentric specimen, 382; testing by end-quench, 292
Hardening, austenite by tempering, 204; cast-iron rolls, 189; by cold-work/transformation technique, 388; dispersion theories, 98; flame, of forgings, 190; flame, stress initiation by, 190; induction, 190, 291; induction, of gear teeth, 90; induction, of rolls, 190; induction surface, 91; low-temperature, 189; precipitation, of stainless steel, 200; solution, 98; surface induction, 91; surface methods, 191; surface, unit for, 91
Hardness, brittle-transition relationship with, 198; cast-iron, relationships with other properties, 198; concepts, 299; effect of anodic surcharging, 299; effects on elasticity and yielding, 387; after explosive loading, 387; grain-size relationship with, 198; grey-iron relationship with other properties, 200; martensite, effect of C, 99
Hardness Tests, Brinell correlations in grey iron, 200; cone-indentation study, 198; machine for, 198; micro, effects of conditions and preparation, 300; micro/macro relationship, 299, 300; Rockwell error-free machine construction, 198; on sand moulds, 187; wire, 198
Heading, cold, advantages, 191; cold, design in, 292
Heat, capacitators system thermal lags, 84; recovery from rolling-mill plant, 90; waste, recovery in electric-power generation, 271 (*Paper*); waste utilization in iron and steel making, 285
Heat Exchangers, transient-temperature calculation in, 84
Heat-Resisting Steel, corrosion by alkali chlorides, 394; corrosion by vanadium oil ash, 206; for gas-turbine blades, 300; gas-turbine, effects of composition on scaling and V_2O_5 attack, 241 (*Paper*); for gas turbines, 199; prolonged-heating effects, 300; review, 97; steam-plant, testing, 199; welding, 294
Heat Transfer, diffusivity measurement, 199; gas-turbulence effect, 84; of metal lattices, 96; in shell-moulded castings, 89; theories, 378
Heat-Treatment, 90, 189, 291, 381; in ammonia atmospheres, 190; bainite formation in tool steels, 189; boron removal by, 189; departmental design and operation, 189; effect on brittleness of high-purity iron–nitrogen alloys, 163 (*Discussion*); effect on impact transition temperatures, 97; effects study by magnetics, 203; in gaseous atmospheres, 189; graphite surface formation in, 390; gun mechanisms, 190; induction, for welds stress relief, 383; isothermal, 91, 190; isothermal curves, 190; isothermal diagrams for chromium cast irons, 204; isothermal, of tool steels, 189; malleable iron, 186; in nitrogeneous atmospheres, 189; phenomena, 189

Heat-Treatment—*Continued*
properties relationship with, 298; selective, 191; in steam, 90; symposium on, 189; tool steels, 190
Heat-Treatment Furnaces, 90, 189, 291, 381; automatic carbon control, 189; automatic control, 90; continuous reciprocating, 90; developments, 189; for gun barrels, 90; shaft type, 190; temperature-distribution determinations, 86; temperature distribution in, 190
Heating, induction dual-frequency, 381; induction high-frequency, 90, 190; of iron and steel works plant, 397; space, from rolling-mill waste heat, 90; steelworks problems, 398
Heating Furnaces, 90, 188, 381; burners for, 381; fuel economy, 189; heat indices, 90; oil-fired, for billets, 381; for strip, 189. *See also* Reheating Furnaces
Heintz Manufacturing Co., cold extrusion of shells, 91
Hercynite, formation and decomposition, 142 (*Paper*)
High-Speed Steel, austempering, 202; bainite formation in heat-treatment, 189; furnace control for, 90; isothermal heat-treatment, 189; study, 295; tempering transformations, 99
High-Temperature Alloys, 199; machining with CO_2 coolant, 194; review, 97; Thermenol, 390; uranium in, 347 (*Paper*)
Holland, flame-radiation trials, 182, 388
Hot Tearing, cast iron, 391; stress requirements, 97
Hot Working, anisotropy in steels, 200
Hungary, nodular-iron rolls production, 186
Hydraulic Power, accumulator systems, 292; control for presses, 292; oils for, 292; variable-speed rotary drives, 91
Hydrochloric Acid, resistant coatings, 93
Hydrogen, blistering of steel, 101; determination behaviour in steel, 396; determination continuously in top gases, 396; determination and effects in steel, 390; effect in cast irons, 200; effect on continuous-cooling transformation diagram for Mn–Mo steel, 353 (*Discussion*); effect on ductility, 199; effect on weld-bead porosity and cracking, 92; effects in yielding, 390; flame reactions, 84; fluorine flames with, 84; silicon equilibrium with, 380; solubility in α-iron, 301; solubility in cupola iron, 390; solubility in Fe–C alloys, 301
Hydrogen Embrittlement, Cr–Mo steel, 391; microstructure aspects, 391; study, 199
Hydrogen-Ion Concentration, " balanced " formula for corrosion studies, 206
Hydrogen Sulphide, scaling by, 395

Impact, cast-iron properties, 391; nodular-iron properties, 391; properties of high-purity Fe–Si, Fe–Ni, Fe–Cr, and Fe–Mo alloys, 163 (*Discussion*); strength variation with temperature, 197; transition temperatures, effect of cooling rate, 97
Impact Tests, on hollow-shank steels, 299; on martensites, 391
Inclusions, carbide, in bearing-steel billets, 290; fatigue-strength relationship study, 388; grain-boundary migration inhibition by, 203; manganese sulphide in grey iron, 188; scrap as source, 290; separation from grey iron, 201; silicate, in grey iron, 201; siliceous, in iron, 159 (*Paper*)
Inconel, hair-line cracking in, 317 (*Paper*)
India, coal-washing plant, 85; iron and steel industry plan, 207, 288; manganese-ore beneficiation trial, 285; manganese-ore deposits, 284, 377; ore-dressing research, 181
Induction Furnaces, cast-iron production in, 187
Induction Hardening, 190, 291; gear teeth, 90; rolls, 190; of surfaces, 91
Induction Heat-Treatment, for welds stress relief, 383
Induction Heating, dual-frequency, 381; high-frequency, 90, 190
Ingot Moulds, basic Bessemer works study, 185; hot topping, 290; research in France, 185; structure study, 185
Ingots, cooling between teeming and stripping, 132 (*Paper*); cooling principles, 87; cracks in fine-grained, 290; forging, heterogeneity, 87; for forging rotors, 87; forging, ultrasonic testing, 198; machining, 383; pouring speed and temperature effects on structure, 120 (*Paper*); production in Sweden, 86; solidification-rate calculation, 90
Inspection, data interpretation, 95
Institut de Recherches de la Sidérurgie, activities, 207
Institute of British Foundrymen, cupola developments review, 186
Institute of Metals, powder-metallurgy symposium, 384
Institute of Physics, laboratory and workshop notes, 303 (*Book*)
Instrumentation, in cathodic protection, 394; dimensional measurement by pneumatics, 197; in heat-treatment, 189; iron and steel industry applications, 102; ironworks, 287; open-hearth Russian, 184
International Welding Institute, welding-electrode classification symbols, 93
Invar, austenite-stability study, 393
Investment Casting, lost-wax plant, 291; mercury process, 89
Iron, alpha, carbon precipitation in storage, 99; alpha, C/N solutions precipitation from, 301; alpha, hydrogen solubility in, 301; alpha, iron nitride precipitate from, 99; alpha, oxygen solid solubility in, 97, 204; Armco, micro surface cracking in working, 93; Bessemer, effect of manganese, 86; bluing in alkaline media, 384; carbon-saturated, desulphurization, 338 (*Paper*); cast. *See* Cast Iron; catalytic decomposition of CO by, 288, 379; cold-worked, X-ray line broadening, 393; corrosion in fused carnallite, 395; corrosion by liquid Zn, 101; corrosion by liquid Zn containing Sb, 101; corrosion as nitric acid container, 395; corrosion, soil-moisture effects, 394; crystals deformation by unidirectional abrasion, 124 (*Paper*); deformation study, 388; deformation in tension, 393; determination by electrolysis, 303; determination in finishing effluents, 396; determination in iron ores, 397; determination of nitrogen in, 396; determination of sulphur by BaCl method modification, 206; diffusion of nitrogen in, 350 (*Discussion*); electrodeposition in analysis, 101; electrolytic etching, 98; gamma-ray penetration, 389; high-purity, effect of Al, 200; high-purity, oxidation, 302; high-purity, photoelectric properties, 394; lattice symmetry, 203; liquid. *See* Liquid Iron; malleable. *See* Malleable Iron; melting in reverberatory furnace, 88; oxygen lancing for steel production in ladle, 187; passivity in chromate solution, 100; phosphorus solid solubility in, 204; pig. *See* Pig Iron; powder compacts for drawing, 384; powder decarburization, 298; powder deformation, 388; powder, diffusion in sintering, 95; powder porosity, 386; powder production in India, 298; powder properties relationships with compacts, 385; powder as welding-electrode coating, 295; production processes, 103 (*Book*); production statistics, 102, 397; sampling for spectrography, 396; sheet, strengthen-effect of enamel, 196; siliceous-inclusions study, 159 (*Paper*); silicon, activities in, 301; silicon, recrystallization in cold rolling, 204; solid-surface reaction with molten Zn-containing Al, 94; sponge. *See* Sponge Iron
Iron Alloys, binary, phase analysis by paramagnetism, 100; carbon solubility in, 39 (*Paper*); γ-loop determination, 100; ternary diagram, 185
Iron–Aluminium Alloys, cold rolling, 382; low-temperature properties, 200; permeability increasing by oxidizing anneal, 300
Iron – Aluminium – Cobalt – Copper – Nickel Alloys, magnetically oriented structure, 98
Iron – Aluminium – Nickel Alloys, single-crystal permanent-magnet properties, 393
Iron–Arsenic–Carbon Alloys, diagram, 301
Iron–Boron Alloys, constitution, 204
Iron–Carbon Alloys, austenite–martensite transformation in, 100; graphitization, 204; hydrogen solubility in, 301; structural changes in tempering, 392; ternary diagram, 185
Iron Carbonyl, powders study, 298
Iron–Cerium System, 393
Iron–Chromium Alloys, tensile and impact properties, 163 (*Discussion*)
Iron – Chromium – Cobalt – Nickel Alloys, powder metallurgy, 387
Iron–Chromium–Molybdenum Alloys, chi phase, 301
Iron–Cobalt–Sulphur System, 394
Iron–Copper Alloys, powder porosity, 386
Iron–Manganese Alloys, carbon solubility in, 39 (*Paper*)
Iron–Molybdenum Alloys, tensile and impact properties, 163 (*Discussion*)
Iron–Molybdenum–Nickel Alloys, electrolytic preparation, 394
Iron–Nickel Alloys, grain-growth study by emission microscopy, 98; powder-compacts expansion study, 386; tensile and impact properties, 163 (*Discussion*)
Iron Nitride, particle size on precipitation from α-iron, 99
Iron–Nitrogen Alloys, effect of heat-treatment on brittleness, 163 (*Discussion*)
Iron Ore, agglomeration, 83; agglomeration methods, 84; beneficiation plant, 84; calciner heat control, 285; Canadian production data, 102; in coking blends, 182; crushing plant at Knutange, 181; determination of iron in, 397; determination of phosphorus by spectrography, 302; discharging and handling plant at Consett, 174, 377; English beneficiation, 380; evaluation, 86; flotation plant and process, 181; fluidized-bed technique, 377; French production data, 284; handling, 377; ilmenite reduction, 86; Krivoi Rog, 83; Lorraine transport costs, 206; lump, reducibility, 219 (*Paper*); magnetite. *See* Magnetite; Mesabi beneficiation plant, 84; mining-mechanization effects on performance and economics, 377; mining in Sierra Leone, 377; oxidizing roasting in Japan, 285; pelletizing of concentrates, 265 (*Discussion*); pelletizing of Northampton sand ironstones by vacuum extrusion, 265 (*Discussion*); pelletizing process for fines, 265 (*Discussion*); pelletizing taconite concentrates, 284; preparation, properties affecting, 377; preparation review, 84; pyrrhotite differential flotation, 285; reducibility of lumps, 219 (*Paper*); reduction, pressure effects, 183; ship trimmers, 181; sintering. *See* Sintering; taconite beneficiation, 84, 284; taconite-beneficiation work of Edison, 285; taconite-grinding motors, 285; taconite properties affecting concentration, 377
Iron Ore Company of Canada, ore deposits, 181

Iron-Ore Deposits, Africa, 206; Algeria, 284; Brazil, 83; France, 284; Jamaica, 284; Krivoi Rog, 83; Labrador-Quebec, 83, 181; Mesabi developments, 397; Minette, 181; Newfoundland, 181; U.S. magnetites, 377; Vosges-Ardennes, 181; Wabana, 181
Iron Oxides, determination in acid slag, 303; determination by electrolysis, 303; fumes, dust precipitation from, 183; magnetite. *See* Magnetite; micaceous, as paint pigment, 196; open-hearth deposition as roof-wear index, 248 (*Letter*); porosities and gas permeabilities, 100; reduction mechanism with solid coke, 30 (*Paper*), 283 (*Corrigendum*); reduction, pressure effects, 183
Iron–Oxygen–Sulphur System, 290
Iron–Phosphorus Alloys, carbon solubility in, 39 (*Paper*)
Iron Pyrites, differential flotation, 285
Iron–Silicon Alloys, carbon solubility in, 39 (*Paper*); α–γ transformation emission-microscope study, 98; γ-loop determination, 100; permeability increasing by oxidizing anneal, 300; silicon activity in, 301; tensile and impact properties, 163 (*Discussion*); zeta-phase heat capacity, 394
Iron–Silicon–Carbon Alloys, carbon activity coefficient in, 43 (*Paper*); nodular-graphite formation in, 187
Iron and Steel Industry, activities review, 102; African prospects, 206; basic-point pricing in U.S.A., 304 (*Book*); in Belgium, 207; gas considerations, 182; Indian plan, 207, 288; Italian re-organization, 288; Japanese raw-materials position, 102; Russian, 397
Iron and Steel Institute, Autumn Meeting, 209; list of periodicals abstracted, 79; powder-metallurgy symposium, 384; Report of Council, 305; rolling bibliography, 280
Iron and Steel Making, fuel technology in, 378; instrumentation in, 102; oxygen applications, 289; physics in, 207; Russian developments, 288; sulphur partition between gas, slag, and metal phases in, 147 (*Paper*)
Iron and Steel Works, heat and power consumption, 85; heating of plant, 397; machinery, 92, 192, 293, 383; traffic, 207; waste-heat utilization, 285
Iron–Sulphur Melts, carbon solubility in, 155 (*Paper*)
Iron–Titanium–Carbon Alloys, graphitization in, 100
Iron–Zinc System, δ–ζ transformation, 101
Ironmaking, direct processes, 84; Duffield process, 288; in east Germany, 397; history in English Black Country, 303; smelting manual, 103 (*Book*)
Ironworks, design and layout at Appleby-Frodingham, 287; early U.S. plantations, 102; old Saugus, restoration, 102
Island Creek Coal Co., coal-preparation plant, 182
Isotopes, radio-active. *See* Radio-Active Isotopes
Italy, corrosion research, 205; corrosion standardization, 205; corrosion symposium, 205; early cannon-foundry practice, 397; electroplating in, 296; iron and steel industry re-organization, 288

Jamaica, iron-ore exploitation, 284
Japan, iron-ore oxidizing roasting, 285; iron and steel industry raw-materials position, 102; steel-industry expansion, 397
Jet Engines, blades and brackets forging, 91; ceramic coatings for parts, 196; rings extrusion, 191
Jones and Laughlin Steel Corp., motorized tongs for coil handling, 192

Kaiser Steel Corp., rolling-mill tension regulation by magnetic amplification, 382
Kempe's Engineer's Year Book, 399 (*Book*)

Laboratories, balances and weights for, 397; glassware design and accuracy for, 397; mass and weight standards, 302; metallurgical, at N.P.L., 202; workshop notes, 303 (*Book*)
Laboratory Furnaces, arc melting, 202; vacuum-melting, at B.I.S.R.A., 187
Ladles, hangers fracture, 197; refractories, 287; refractories wear, 379; refractory linings, 182; steel production in by oxygen-lancing method, 187
Lead, corrosion, soil-moisture effects, 394
Lead–Tin Alloys, removal from tinned iron, 94
Lighting, foundry, 188
Lime, determination in open-hearth slags, 397; effects in sinters, 377; properties effects in steelmaking, 378
Limestone, African deposits, 206; decomposition energies, 286; testing, 378
Liquid Fuel, coal replacement by, 182; flow-measuring transmitter, 182; stability in storage, 182
Liquid Iron, carbon/oxygen equilibrium in, 99; deoxidation, aluminium reactions in, 87; desulphurization by calcium carbide, 88; effect of silicon on carbon activity coefficient in, 43 (*Paper*); fluidity studies, 185; oxygen in, 97; silicon equilibrium with, 380; slag reactions with, 288
Liquid Metals, gas-content determination, 188; viscosity as phenomenon of intercrystalline mutations, 185
Locomotives, shunting-type, 193
Lubricants, 193, 294, 383; additive for, 294; assessment by performance, 294; bearing, review, 383; conference on, 294; constitution, 193; cutting, corrosion by, 395; cutting, recovery, 93; grinding, twin-fluid process, 194; machining, 294; molybdenum disulphide, 193; oils structures, 294; for powder metallurgy, 196; test apparatus, 294; testing, 383; tests interpretation, 294
Lubrication, 193, 294, 383; bearings, review, 383; conference on, 294; effect on fretting corrosion, 101; gear, 193; hydrodynamic, of roller bearings, 294; mechanism of, 193; roller bearings, 294; rolling-mill, 193; tinplate-plant, 193; wire-rope, testing, 294
Lysaght (John), Ltd., rolling mills at Normanby Park, 92

Machinability, 93, 194, 295, 383; effects of composition, 383
Machining, 93, 194, 295, 383; CO_2 coolant in, 194; drilling by ultrasonics, 194; electric-spark, 383; electric-spark etching of tools, 392; electric-spark by Sparcatron process, 93; ingots, 383; lubricants for, 294; peeling tools for shafts, 194; Sparcatron process, 93; tools, 103 (*Book*); ultrasonic, 194; ultrasonic drilling, 194; wastes reclamation, 93
Magnaflux Corp., Stresscoat All-Temp, 95
Magnesite. *See* Refractory Materials
Magnesium, powder metallurgy, 387
Magnesium Alloys, nodular-iron production from scrap, 88
Magnesium–Ferrosilicon Alloys, nodular-iron production from, 88
Magnesium Phosphate, heat of formation, 381
Magnetic Alloys, powder-metal strip production, 386
Magnetic Amplification, rolling-mill tension regulation by, 382
Magnetic Analysis, phase determination by in binary iron alloys, 100
Magnetic Crack Detection, 388, 389
Magnetic Materials, powders, 384; shell moulding, 89
Magnetic Properties, anisotropy determination in sheet, 300; cast iron, 202; comparator for, 389; hysteresis-loop
Magnetic Properties—*Continued*
plotter, 198; microstructure relationship with, 98; permeability of powder-metal strip, 386
Magnetic Testing, of heat-treatment effects, 203; methods, 388; steels sorting by, 96, 300
Magnetite, geology of New Jersey deposit, 377; geology of Pennsylvania deposit, 377; transition at low temperatures, 393
Magnetization, temperature curves, balance for determination, 96; watt-loss measurement errors by, 96
Magnets, production by shell moulding, 89
Maintenance, policies and methods, 207
Malleable Iron, annealing curves, 187; annealing - furnace conversion to natural-gas firing, 187; annealing practice, 187; blackheart temper embrittlement, 202; effects of furnace atmosphere on properties, 88; foundry for, 187; graphite-nodule size effects, 391; oxygen effects in production, 187; production by cupola/reverberatory-furnace duplexing, 186; quality control, 187; variation by heat-treatments, 186; whiteheart containing Mo, Mn, or Cr, 201; whiteheart ductility, 201
Malleable-Iron Castings, whiteheart, production, 186
Manganese, determination in alloys, 396; effect in Bessemer iron, 86; effect in Cr die steel, 200; effect on desulphurization of carbon-saturated iron, 338 (*Paper*); effect on forgeability, 292; effect on semi-killed hot-rolled steels, 97; electrolytic production, 185; recovery from low-grade ores, 285
Manganese Alloys, cast, properties, 301
Manganese–Molybdenum Steel, effect of hydrogen on continuous-cooling transformation diagram, 353 (*Discussion*)
Manganese–Nickel Steel, welding, 294
Manganese Ore, beneficiation, 84; beneficiation trial in India, 285
Manganese-Ore Deposits, Brazil, 83; Indian, 284
Manganese Phosphate, heat of formation, 381
Manganese Plating, laboratory method, 195
Manganese Steel, austenite decomposition in, 99; austenitic, 198; austenitic, brass replacement by in non-magnetic applications, 300; austenitic castings, 381; forgeability, 292; welding, 294
Manganese Sulphide, inclusions in grey iron, 188
Martensite, effects of deformation and cooling on transformation, 393; formation, effect of carbon, 99; formation in Fe–C alloys, 100; hardness as function of carbon content, 99; tensile and impact properties, 391; transformation characteristics, 204
Martin-Baker Aircraft Co., Ltd., finishing practice, 93
Mechanical Handling, fork trucks at Lorain, 192; by motorized tongs, 192
Mercury, patterns for investment casting, 89
Metal Mixers, bay at Abbey, 46 (*Paper*)
Metal/Slag Reactions, blast-furnace-type, 288; sulphur partition in, 147 (*Paper*); sulphur transfer across interface, 184
Metal Spinning, 91
Metallizing. *See* Spraying
Metallografiska Institutet, electron microscope, 202
Metallography, 98, 202, 301, 392; cast irons, 203; electrolytic etching, 98; electron-microscope, 98, 208; etching by cathodic vacuum, 295; etching by electric spark, 392; etching for phosphorous, 392; high-resolution replicas, 392; hot-metal, 98; photomicrography in colour, of nodular iron, 202; polishing machine for, 202; silica replicas, 392; siliceous-inclusions study, 159 (*Paper*); surface preparation for, 202

Metallurgy, dictionary of, 398; engineering, 304 (*Book*); physical chemistry and metal extraction, 398 (*Book*); Russian textbooks, 102
Metals, colouring, 296; dispersions effects on properties, 98; electron emission from, 98; extraction metallurgy, 398 (*Book*); identification device, 199; intergranular phenomena, 392; lattice thermal conductivity, 96; liquid. *See* Liquid Metals; melting and freezing fundamentals, 185; microstructure relationships with properties, 98; oxygen solid solubility, 204; rare, 207 (*Book*); reactivity factors, 385; shrinkage and growth determination, 199; single-crystal rotors, 393; single-crystals dislocations, 203; single-crystals production by solidification, 99; single-crystals surface examination method, 203; spinning, 91
Microscope, flat-field objective, 98; hot-stage metallurgical, 98
Microscope, Electron, diffraction focusing, 98; diffraction-grating copies for calibration, 98; hardenability/structure study, 393; iron-oxidation study, 302; iron and steel structures study, 202; at Metallografiska Institutet, 202; in metallography, 98, 202; permanent-magnet structure study, 98; replication by vapour-phase carbon, 392
Microscope, Emission, grain-growth study by, 98
Midvale Co., gun-barrel heat-treatment plant, 90
Mild Steel, brittle-fracture testing, 197; cladding with stainless, 201; caustic embrittlement, 101; corrosion by alkali chlorides, 394; corrosion by chlorine, 395; corrosion-inhibitors effects in nitric acid, 395; deformation effects on recrystallization, 392; hardness plateaus and twinning after explosive loading, 387; hydrogen yield point, 390; impact transition temperatures, 97; oxidation-preventive coatings, 100; oxidation study, 395; production in electric furnace, 87; stress-corrosion cracking, 101; weld testing, 193
Mill Scale, removal by high-pressure water, 293
Mills (James), Ltd., bright steel parts, 382
Mineral Resources, 83, 181, 284, 377; Finland, 181; Quebec, 284; U.S. eastern states, 181; Vosges-Ardennes, 181; Yugoslavia, 83
Minerals, dressing laboratories, 84; pulverizing mills, 285
Mining, Australian developments, 284; drill-bits selection, 284; drill-rod quenching, 292; drills, diamond-bit action, 284; drills, diamond-bit cube orientation, 284
Minneapolis-Moline Co., cupola dust collecter, 88
Models, blast-furnace-hearth for thermal studies, 17 (*Paper*); blast-furnace smelting trials at U.S. Bureau of Mines, 288; blast-furnace, in tuyere-coke movement study, 184; open-hearth, for heat-transfer calculations, 227 (*Paper*)
Molybdenum, cold-worked, X-ray line broadening, 393
Molybdenum Alloys, cast, properties, 301
Molybdenum Disulphide, as lubricant and fretting-corrosion inhibitor, 193
Molybdenum Steel, creep-rupture data, 320 (*Paper*); creep in steam-pipe applications, 390; decarburization prevention in heating, 90
Molybdenum–Vanadium Steel, creep-rupture data, 320 (*Paper*)
Moulding, hand and machine, 188; pipes, 89; pressure, 89, 188; shell. *See* Shell Moulding
Moulding Machines, time measurement with, 89
Moulding Sand, grain-size distribution effects, 381; high-temperature behaviour, 381; load behaviour, 187; hardness testing, 187; heat transfer, 88; metal penetration, 89; moisture-content effects, 88; *p*H value effect on casting quality, 89; permeability of fine/coarse mixtures, 381; premixing of additives, 187; stripping test, 187; synthetic, mulling, 89; testing, 187; testing under load, 187
Moulds, chill, solidification in, 90; effects on casting defects, 188; heat transfer of mixtures for, 88; ingot. *See* Ingot Moulds; metal flow in, 185; permanent graphite, 187; sand, gas evolution from, 188; sand, hardness testing, 187; sand, solidification in, 90; shell. *See* Shell Moulding
Mullite. *See* Refractory Materials

National Bureau of Standards, energy transfer in hot gases symposium, 84; mass and weight standards, 302; soil-corrosion study, 302
National Coal Board, coal cleaning, 378
National Forge and Ordnance Co., flame hardening forgings, 190
National Physical Laboratory, electron-microscope diffraction grating, 98; laboratory balances and weighing, 397; laboratory glassware design and accuracy, 397; metallurgical-laboratories extension, 202
Nederlandsche Kabelfabrieke, wire and billet mills, 192
Newfoundland, iron-ore deposits, 181
Nickel, corrosion by alkali chlorides, 394; determination in finishing effluents, 396; effect on cast-iron soil corrosion, 206; lattice symmetry, 203; powder production from ore, 196
Nickel Alloys, hard facing by, 195, 298
Nickel Oxide, reduction by carbon, 183
Nickel Plating, adhesion peeling test, 295; bright, of automobile bumpers, 296; crack prevention, 296; Kanigan process, 296; surface cleaning for, 295; surface-roughness measurement, 93
Nickel-Plating Solutions, analysis by polarography, 396; sulphamate, 195; sulphonate practice, 296
Nickel Steel, austenite stability in, 393; powder metallurgy, 386
Nickel-Tin Plating, corrosion tests, 395
Nickel–Tungsten Alloys, powder metallurgy, 387
Niobium, determination in stainless steel, 396
Niobium Alloys, cast, properties, 301
Nitric Acid, corrosion inhibition in, 395; corrosion resistance of Al and Fe as containers for, 395
Nitriding, carbo, 190, 291; carbo, equipment, 190; C_2N_2O in, 190; Cr–Mo–Ni tubes with high-pressure N, 191; diffusion columnar-grain layer formation in, 392; Malcolm process, 382; methods and equipment, 191; Nitrocycle process, 91; pressure ammonia process, 91; stainless steel, 382
Nitrogen, in Cr–Mn–Ni steel, 393; determination and effects in steel, 390; determination in iron and steel by distillation, 396; diffusion in iron, 350 (*Discussion*); effect on graphitization, 390; heat-treatment by, 189
Nitrogen Oxides, coal treatment by, 85
Nodular Cast Iron, annealed, hardness and strength relationships with composition, 202; annealing dilatometric curves, 187; as brake-shoe material, 198; castings production, 187; castings risering, 89; as crankshaft material, 88; creep and stress-rupture at high temperatures, 390; density decrease during plastic deformation, 202; economics and prospects of, 88; graphite formation in, 186; graphite formation, effect of copper, 201; graphite formation, effect of metal
Nodular Cast Iron—*Continued*
surface tension, 187; graphite formation in Fe–Si–C alloys, 187; graphite structure, 203; graphitization in quenched and tempered state, 392; growth of, 203; impact properties, 391; photomicrography in colour, 202; production by Ca_2Si inoculation, 291; production by continuous-rod inoculant, 186; production from Mg–FeSi alloys in cupola, 88; production preparation by calcium carbide injection, 88; rolls, 92, 186; specifications and tests, 201; temper embrittlement, 202; testing, 201; weldability, 193; welding, 294
Noise, abatement in industry, 102; foundry amelioration, 188; measuring equipment, 102
Non-Destructive Testing, eddy-current methods, 389; electro-acoustic methods, 389; electronic instruments for, 388; instruments for, 388; nature and development, 388; of sternpost, 199; symposium, 198, 388; of welds, 389
Non-Metallic Inclusions, in arc welds, 93; effect of chromium, 290
Norway, pig-iron production in electric furnace, 183
Nucleation, graphite in steel, 203; oriented growth-selectivity theory, 203; pearlite, 202; in recrystallization, 203

Obituary Notices, 76, 281, 374
Oil, quenching, 91
Oil Refineries, corrosion in, 205; corrosion inspection, 206; corrosion by water in, 206; metals for, 391
Oil Wells, corrosion-inhibitors testing, 101
Open-Hearth Furnace, automatic control, 184; automatic control by Russian instruments, 184; availability increasing by planned repair programme, 289; charging delays due to bunching, 260 (*Paper*); charging and fluxing practices, 289; costs comparison with electric furnace, 185; design and construction, 289; duplexing with acid converter, 173; fettling machine, 289; Maerz, at Marrel, 184; Maerz-type chrome-magnesite burners, 289; multi-point recorder for, 397; practice at Volta Redonda, 1 (*Paper*); roof-wear determination by iron oxide deposition, 248 (*Letter*); scrap supply to, 252 (*Paper*); stainless scrap remelting in, 184
Open-Hearth Models, for heat-transfer calculations, 227 (*Paper*)
Open-Hearth Process, aerodynamic considerations, 289; basic, slag control, 289; comparison with basic Bessemer process, 289; heat balance for Maerz system, 184; heat-transfer study on model, 227 (*Paper*)
Open-Hearth Slag, analysis by photometry, 303; basicity determination by fluoride method, 397; basicity reduction, 289
Ordnance, recoil-mechanisms heat-treatment, 190
Ores, agglomeration, 181; cyclones behaviour, 285; crushing-ball and rods charging methods, 377; crushing-ball wear parameters, 377; determination of phosphorus in, 303; dressing research in India, 181; gravitational classifiers, 285; grinding trials, 83; microradiography, 378; mining and treatment, 83, 181, 284, 377; sampling, 185; sampling equipment, 181; textures, 303 (*Book*)
Organisation for European Economic Co-operation, gasification report, 182
Oxidation, in alkaline media, 384; of Al–Mn steels, 390; of heated metals, 205; high-purity iron, 302; iron, 302; mechanism, 100; mild steel for rolling, 395; protective coatings, 100
Oxy-Acetylene Flames, resurfacing by, 94; stress relief of weldments by, 291, 383

Oxygen, in blast-furnace, 287, 288; blowing in converter, 184; blowing in converter by Demag lance, 184; blowing in converter by L.D. process, 87, 97, 288; carbon equilibrium with in liquid Fe, 99; in cast iron, 97; control instruments in combustion, 378; determination and effects in steel, 390; determination in steel by Herty method, 396; determination, vacuum-fusion melting apparatus for, 206; effects on grain-size and hardenability, 301; engineering uses, 295; iron lancing by for steel production in ladle, 187; iron and steel making applications, 289; in Fe–S system, 290; in liquid iron, 97; metal-industry uses, 207; pick-up in steel, 290; production plant, 102; solid solubility in metals, 204; solubility in α-iron, 97; steelmaking applications in Britain, 184; storage in vacuum tanks, 397
Oxygen-Enriched Air, blast-furnace trials, 287, 288; in converter, 380
Oxygen Lancing, for steel production in ladle, 187

Packaging, spray methods, 296, 384
Painting, dip, electrostatic detearing, 95; economics for corrosion protection, 195; preparation for, 195
Paints, anti-fouling vinyl-type, 101; durability tests in Sweden, 301; micaceous iron oxide as pigment, 196; protective, 196; protective, pigment-action testing, 205; protective, for ships, 94, 101, 394; silver, for strain-gauge slip rings, 96; specifications for metals, 196; zinc-rich, cathodic protection by, 94
Park Gate Iron and Steel Co., Ltd., bar mill, 192
Patternmaking, in mercury for investment casting, 89
Pearlite, austenite transformation, 99; growth study by emission microscope, 98; nucleation, 202
Peat, as power source, 85
Permanent Magnets, oriented-structure study by electron microscope, 98; from powder metals, 384; single-crystal Fe_2NiAl properties, 393; sintered Al- and Co-containing, 384
Personnel, dermatitis prevention, 381; heat-resisting aluminized clothing, 207; job evaluation, 398
Peru, electric furnaces at Chimbotte, 288
Phosphate Coatings, cold-applied, 205; as cold-extrusion lubricant, 91; in corrosion protection, 205
Phosphorus, behaviour in blast-furnace, 380; determination in ores and agglomerates, 303; determination by spectrography, 302; effect on hardness correlations in grey iron, 200; etching for in metallography, 392; reduction in coking coals, 378; removal from iron, 380; solid solubility in Fe, 204
Photoelastic Analysis, Catalin/Perspex sandwich technique, 388; frozen-stress phenomena, 388; gelatin in, 388; patterns relationship with fatigue, 95
Photography, camera for fine-structure determination, 388; cinematographic study of resistance welding, 294
Photometric Analysis, determination of silicon in small amounts, 302; of slags, 303
Photomicrography, colour, of nodular iron, 202
Physics, in iron and steel making, 207
Pickford, Holland and Co., Ltd., Crook works, 286
Pickling, 93, 194, 295, 383; acid closed-cycle lines, 194; coil handling by motorized tongs, 192
Pickling Liquor, waste, treatment system, 383
Pig Iron, casting in machine-moulded beds, 288; dephosphorization, 380; desulphurization by sodium carbonate, 379; liquid, sampling, 183; liquid,

Pig Iron—*Continued*
vanadium recovery from, 183; production, 86, 183, 287, 379; production data for Czechoslovakia, 182; production by Duffield process, 288; production in electric furnaces, 183, 288, 379; production in Sweden, 86
Pipelines, corrosion, 302; corrosion-indicating instruments, 101; corrosion, soil-activity analysis, 205; oil-flow measurement by transmitter, 182; wall-thickness testers, 101
Pipes, cast-iron, spinning, 381; centrifugal casting, 188, 291; centrifugal casting in horizontal machine, 89; corrosion in hot-water systems, 101; corrosion inhibition by amines, 100; corrosion inhibition by Saran, 195; handling by fork trucks, 192; heating, corrosion in, 205; internal coating in place, 194; steam, steels creep, 390; transient-temperature calculation in, 84; welded, plant layout, 383
Pittsburgh Steel Co., cold mill at Allenport, 192; wiremaking, 191
Plasticity, determination by cone indentation, 300
Plastics, bearings, 293; bearings friction characteristics, 383; as core binders, 89; plating-plant applications, 296; in shell moulding, 188; as soaking-pit cover linings, 188
Polarographic Analysis, corrosion-kinetics study by, 205; determination of chromium, 396; electrode-potentials calculation, 395; of nickel-plating baths, 396
Polishing, chemical, 383; electrolytic. *See* Electrolytic Polishing; machine for metallographic specimens, 202
Powder Metallurgy, 95, 196, 298, 384; alloying developments, 196; aluminium-alloys preparation by, 387; aluminium sinterings, 387; bearings self-lubricating matrix, 387; cermets, 95, 387; cermets bonding, 196; cermets from metal-oxide systems, 387; cermets rupture strength, 387; cermets spraying, 95; chromium carbide in hard-metal alloys, 387; compacting by rolling, 386; copper-compacts fatigue properties, 386; copper–lead bearing materials production, 386; copper–lead bearing materials testing, 387; copper–nickel–tungsten alloys, 387; copper pressing characteristics, 385; copper rolling, 386; in engineering, 384; filter elements in, 385; finishing of parts, 384; gas-content determination in, 385; grain growth in sintering, 385; grinding in, 384; high-strength pressings and sinterings, 386; hot compacting, 386; hot pressing of beryllia, 386; impregnation advantages, 95; impregnation mechanism, 385; iron carbonyl study, 298; iron compacts for drawing, 384; iron decarburization, 298; iron deformation, 388; iron diffusion in sintering, 95; iron, in India, 298; iron oxidation, 302; iron porosity, 386; iron powders relationships with compacts, 385; iron as welding-electrode coating, 295; Fe–Cr–Co–Ni alloys, 387; iron–nickel expansion study by, 386; lubricants evaluation, 196; magnesium, 387; magnetic-alloy strip production, 386; magnetic applications, 384; nickel, 196; Ni–MgO-type cermets, 95; nickel-steel parts production, 386; nickel–tungsten alloys, 387; particle-size analysis in, 384; pore-size distribution in, 385; pore-volume properties, 385; powders as by-products from other processes, 95; press for, 298; pressing refractory oxides, 298; production possibilities, 298; reactivity factors, 385; rolling in compacting, 386; rolling into strip, 384; silicides of 4th–6th group transition metals, 387; silicon-based cermets, 300; sintered carbide. *See* Sintered Carbides;

Powder Metallurgy—*Continued*
sintered permanent magnets, 384; sintered structural parts, 386; sintering atmospheres, 386; sintering mechanism, 385; sintering study, 298; sintering thermo-electric force changes, 385; sintering in vacuum, effects of boron, 386; stainless steel compacts, 386; in stainless steel gas-turbine blade production, 386; stainless steel powder production by electrochemical method, 386; stainless steel powder production from scrap, 196; symposium, 384; tantalum, 384; testing in, 384; titanium-aluminium sinterings, 387; titanium carbide. *See* Titanium Carbide; titanium sinterings, 387; tungsten alloys, 387; tungsten carbide. *See* Tungsten Carbide; zirconium, 384
Power-Samas Accounting Machines, Ltd., barrel finishing, 295
Precision Casting, lost-wax plant, 291; mercury process, 89
Pressing, 91, 191, 292, 382; Hydroform process, 91
Pressure Vessels, Carillay steel for, 201; steels testing under ammonia-synthesis conditions, 301; stress/strain relations, 200; welded, stress relief by oxy-acetylene flames, 291
Producer Gas, cleaned, in annealing, 189
Production Engineering Research Association, corrosion by cutting fluids, 395; electropolishing bibliography, 194
Productivity, foundry, 188
Pumps, corrosion in, 395
Pyrometers, bichromatic, 182; immersion Czechoslovakian, 286; immersion, for foundry, 286; needle thermocouples, 182; optical, 182; optical, operation and maintenance, 85; optical photoelectric, 286; optical, standardization, 379; radiation-types comparison, 182; sheathed, 378; standardization in Germany, 182; suction-type, for boiler gases, 379

Quality Control, of malleable iron, 187; in metalworking, 102; in sintering, 284; in tool-steel production, 87; of wire, 191
Quenching, alpha-range, effect on impact transition temperature, 97; batch systems, 292; hollow drill rods, 292; interrupted, 292; media, 292; media evaluation, 292; oils for, 91; salt-bath testing, 382

Radio-Active Isotopes, in cleaning study, 295; electrolysis partial - intensity study by, 296; iron oxide porosity study by, 100; protection against Ra, Co, and Cs, 389; testing by, 388; uses in industry, 389
Radiography, auto, of dendrites, 392; beta-ray, 199; betatron, 199; betatron-efficiency study, 96; cesium, 389; of cracks, 389; Eresco equipment, 388; gamma, 199; gamma, of cast irons, 199; gamma-ray penetration in iron, 389; gamma-ray resonant scattering, 300; gamma, Swedish research, 300; iridium, 198, 199; micro, ores and sinters study by, 378; testing by, 388; weld, 198
Rails, hard-faced, 193
Railway Wagons, galvanizing, 297; nodular-iron brake shoes, 198; wheels pressure casting, 187
Railways, shunting engines and capstans, 193
Recrystallization, in cold-rolled silicon irons, 204; deformation effects on, 392; nuclei, 203; secondary textures in f.c.c. metals, 203; sigma-phase relationship with, 392
Recuperators, construction and economics, 378; for cupola-blast preheating, 186; metallic, in furnaces, 285; metallic, in steel industry, 378; refractory, 285; steel-type, in reheating furnaces, 189

Refractory Materials, 86, 182, 286, 379; air-furnace, life relationship with temperature, 88; arc-furnace, 290; beryllia hot pressing, 386; blast-furnace, 379; brick production by foam method, 379; casting-pit, 287; creep, 287; determination of silica in, 336 (*Paper*); electric-furnace rammed mix, 185; grain-size determination, 286; heat-transfer measurement, 287; hercynite formation and decomposition, 142 (*Paper*); insulation bricks, 86; kieselguhr, 379; ladle, 182; ladle, wear, 379; plant, 286; properties in relation to use, 182; rammed, 182; rammed electric-furnace, 185; slag attack, 182; slag migration into brickwork, 183; steel-casting, wear, 379; structural stability, 379; thermal analysis, 286; thermal-conductivity/density relationship, 287; thermal-shock testing, 287; wastage by attack, 182

Refractory Materials (Carbon), 286; blast-furnace study by hearth thermal model, 17 (*Paper*); in metallurgy, 182

Refractory Materials (Chrome-Magnesite), Corhart, 287; in open-hearth burners, 289

Refractory Materials (Dolomite), decomposition energies, 286; open-hearth fettling machine, 289; plant in Bessemer steelworks, 286; prefabricated sections for arc furnaces, 290; tar mixtures in converter, 184, 380

Refractory Materials (Fireclay), properties, 182; ramming and drying, 182

Refractory Materials (Magnesite), Brazilian deposits, 377; Yugoslav deposits, 181

Refractory Materials (Mullite), formation, 286

Refractory Materials (Silica Brick), production, 86; production by foam method, 379; properties, 182

Refractory Materials (Silicon Carbide), production and uses, 286

Refractory Materials (Sillimanite), production and behaviour, 379

Reheating Furnaces, automatic control, 184; oil-fired, for billets, 381; recuperators, 189

Republic Steel Corp., extensions at Cleveland, 184

Research, boron-steel, 200; coking, 286; corrosion, 205; corrosion, in Italy, 205; corrosion-protection, 205; flame-radiation, 182, 378; foundry, in France, 291; gamma-radiography in Sweden, 300; ingot-mould, 185; low-shaft furnace at Ougrée, 36 (*Paper*); operational, 398; ore-dressing, in India, 181; organization in Europe, U.S.A., and Canada, 398; shell-moulding, 89; tin-alloy electrodeposition, 94; on welding arc, 294

Reserve Mining Co., taconite beneficiation, 84, 284, 397

Resins, furane, foundry applications, 188; Saran, as corrosion inhibitor, 195; vinyl coatings against sea-water corrosion, 101

Rod, descalers for wire drawing, 194; rolling, 293

Rolled Sections, cold drawing, 191; joists plastic behaviour, 197

Rolling, 92, 192, 292, 382; bibliography on, 280; billet, at Consett, 174; billet descaling machine, 185; billet handling by fork trucks, 192; bloom defects from, 382; in cold-drawing preparation, 191; cold, of Fe–Al alloy, 382; cold, of razor-blade steels, 300; cold, recrystallization effects, 204; cold, of sheet, 92; cold, strip graphical representations, 293; cold techniques, 382; at Consett, 173, 174; flat methods, 293; Flowturn process, 292; powder copper, 386; power requirements for sections, 292; pressure calculation, 382; roll temperature stresses during, 192; roughing-down, 293; slab, at Consett, 174; special steels, 103 (*Book*); speed formulæ, 293; stainless steel

Rolling—*Continued*
with rare-earth additions, 200; temperature effects on surface texture, 383; theories literature review, 92; theory, 192; tube-blank cracking in, 293; tubes in piercing mill, 293; wire spreading in, 192

Rolling Mills, 92, 192, 292, 382; bar, 382; bar, guides and strippers for, 58 (*Paper*); bar, at Park Gate, 192; bar/rod, 382; blooming and billet at Normanby Park, 92; blooming hand-operated modernization, 293; cold, 382; cold, at Allenport, 192; cold-strip, at Newport, 293; at Consett, 173, 174; continuous billet at Consett, 173, 174; electrical-drive breakdowns, 293; electrical drive at Fairless, 92; electrical drives, 292, 382; guides and strippers, 58 (*Paper*); for light sections, 192; lubrication, 193; piercing, 293; piercing, for tubes, 293; planetary drive, 292; plastic bearings, 293; repeating-hoop, at Barrow, 293; rod, guides and strippers for, 58 (*Paper*); rod, at Kokomo, 293; slabbing, 192; slabbing/blooming at Consett, 173, 174; straightening, 193; strip, enlargement at Mannesmann, 293; tandem, screw and speed-setting changes effects, 292; tapered roller bearings, 92, 293, 294; temper, as descaling unit, 192; tension magnetic-amplifier regulator, 382; waste-heat recovery, 90; wire and billet, at Delft, 192

Rolls, cast-iron, hardening, 189; cast-iron, review, 192; cast-iron, welding, 295; induction hardening, 190; neck plastic bearings, 293; neck tapered bearings, 92, 293, 294; nodular-iron, 92, 186; oval-pass design, 293; pressure calculation, 382; pressure and torque formulæ, 292; refacing by welding 295; temperature stresses, 192; types and uses, 293

Rotary Electric Co., bar mill, 382

Royal School of Mines, mineral-dressing laboratories, 84

Rupture, creep, of molybdenum steels, 320 (*Paper*); creep, properties, and structural effects, 300

Russia, iron-ore deposits of Krivoi Rog, 33; iron and steel industry, 397; iron and steel making developments, 288; metallurgical textbooks, 102; open-hearth control instruments, 184

Rust, removal by electrolysis, 205, 295

Rutherford, E., biographical lectures, 103 (*Book*)

Rutile, oxygen pressure, 86

Ryan Aeronautical Co., radial-forming technique, 292

Rylands Bros., Ltd., annealing plant, 191

Salt Baths, Ajax type, 189; gun-parts treatment in, 190; quenching-power test, 382; for wire annealing and patenting, 191

Sampling, ferro-alloys and ores, 185; iron and steel for spectrographic analysis, 396; liquid pig iron, 183; ores, 181, 185

Scale, mill, removal by high-pressure water, 293

Scaling, gas-turbine alloys, effect of composition, 241 (*Paper*)

Scotland, peat resources, 85

Scrap, balers, 92; baling press, 383; borings and turnings melting in cupola, 186; as inclusions source, 290; machining, recovery, 93; stainless-steel powder production from, 196; stainless steel, remelting in open-hearth, 184; storing and sorting, 290; supply difficulties in Europe, 397; supply to open-hearth, 252 (*Paper*); swarf briquetting press, 93; tool-steel, utilization, 295

Screws, threads fatigue strength, 299

Sendzimir Galvanizing, of strip, 94

Shafts, peeling tools, 194; steel, surface-preparation effect on fatigue, 299

Sharon Steel Corp., plastic soaking-pit cover linings, 188

Shearing, shock fatigue in, 92; theory, 197

Sheet, anisotropy determination, 300; thickness determination by ultrasonics, 302; thickness determination by eddy current, 389

Sheet Steel, annealing by clean producer gas, 189; cold rolling, 92; deep-drawing properties, 170 (*Discussion*); welding by foil-butt process, 193

Shell Moulding, castings heat transfer, 89; Dietert process, 188, 291; machines and equipment for, 291; magnet steel, 89; plastics in, 188; research, 89

Shells, extrusion, 91; tapered, drawing, 191

Ships, cathodic protection, 100; corrosion of machinery, 100; corrosion protection, 101; corrosion protection by vinyl paints, 101; iron-ore, mechanical trimmers, 181; iron-ore unloading, 377; LD Bessemer steel acceptance tests for, 97; liberty, brittle fracture in, 388; paints for, 394; plate-weld shot peening, 194; sternpost non-destructive testing, 199; weld non-destructive testing, 389

Shot Blasting, in cleaning, 93

Shot Peening, effect on fatigue, 197; weld final pass, 194; weld studies, 194

Sigma Phase, in binary alloys, 203; effect of cold work and recrystallization, 392; effects on stainless steels, 391; identification, 392; Fe–Cr–Mo–Nitype, 301; review, 203; in stainless steels, 203

Silica, determination in ores, slags, and refractories, 336 (*Paper*); equilibrium in liquid slag, 380

Silicon, activity in liquid Fe–Si and Fe–Si–C alloys, 301; determination by rapid method, 396; determination of small amounts by photometry, 302; determination by spectrophotometry, 302; effect on carbon activity coefficient in liquid iron, 43 (*Paper*); effect on desulphurization of carbon-saturated iron, 338 (*Paper*); effect on graphitization, 390; equilibria in iron, slags, and gases, 380; reduction by hydrogen, 380

Silicon Carbide, production and refractory uses, 286; solubility in liquid iron, 301

Silicones, coatings electrical resistivity, 196

Sillimanite. *See* Refractory Materials

Simplex Electrical Co., Ltd., whiteheart malleable castings production, 186

Sinter, on blas effectt-furnace performance, 83, 181, 286; effect of lime, 377; microradiography, 378; production and advantages, 84; quality control, 284; quality relationship with moisture and coke contents, 84; self-fluxing, 377; test-methods evaluation, 83; testing, 84

Sintered Carbides, press for, 298

Sintering, at Algoma Steel Corp., 83; control in, 284; review, 84; theory of, 84

Sintering Plant, at Knutange, 181

Skinningrove Iron Co., Ltd., oxygen applications, 184

Slag/Metal Reactions, blast-furnace-type, 288; sulphur partition in, 147 (*Paper*); sulphur transfer across interface, 184

Slag Wool, production and properties, 183; sulphur combination and behaviour in, 86

Slags, acid, determination of FeO in, 303; activities in, 290; Bessemer basic as fertilizer, 380; basicity determination by microscope, 289; blast-furnace, constitution, viscosity, and desulphurization mechanism, 183; blast-furnace granulated, 183; blast-furnace pumice-type, 183; blast-furnace, reactions with metal, 288; blast-furnace, sulphur in, 86; blast-furnace, utilization, 86; blast-furnace, wool production and properties, 183; determination of silica in, 336 (*Paper*); electrical conductivity, 290; fertilizing action, 183; ion-exchange equilibria, 289; liquid,

Slags—*Continued*
electrochemical study, 184; pumice-type, for building, etc., uses, 183; refractories penetration by, 183; refractories wastage by, 182; silica equilibrium in, 380; thermodynamics and structures, 289; treatment and use, 86, 183; viscosity studies, 183, 289
Soaking Pits, 90, 188, 381; automatic control, 184; Cr–Ni steel covers, 300; at Ford works, 189; maintenance costs, 381; plastic cover linings, 188
Società Montecatini, corrosion problems, 205
Società Nazionale Metanodotti, electrolysis division, 205
Société Metallurgique de Knutange, burden preparation, 181
Sodium Carbonate, pig-iron desulphurization by, 379
Sodium Chromate, corrosion inhibition by in antifreeze solution, 395
Sodium Hydroxide, corrosion inhibition by, 206
Sodium Metaphosphate, corrosion inhibition by, 395
Soldering, stainless steel, 294
Solidification, cast iron under centrifugal pressure, 291; cast-iron surface-tension effects, 187; of cast irons, 291; of castings, 188; castings length changes in, 188; chill-action studies, 90; of cylinders, 90; fundamentals, 185; ingot rate calculation, 90; of shell-moulded castings, 89; single-crystals production by, 99; steel castings, 381; in various moulds, 90
Spain, wire-drawing terminology, 382
Special Steels, passivation by oxidizing agents, 205; rolling, 103 (*Book*)
Spectra, flame, 84
Spectrochemical Analysis, arc-striking delay, 396; electrodes for powders, 396; literature review, 102
Spectrographic Analysis, arc high-voltage A.C. source, 206; determination of phosphorus, 302; index line and point determination, 302; line-pairs selection, 396; sampling iron and steel for, 396; spark source, 302; of special-composition alloys, 302; X-ray fluorescent, symposium, 102
Spectrophotometric Analysis, determination of silicon, 302
Spectroscopic Analysis, direct-reader with D.C. arc, 102; in graphitization study, 396
Spinels, phase relations, 287
Sponge Iron, production in Sweden, 86
Spraying, coatings impregnation and organic finishing, 95; coatings porosity: 95; electrostatic, 93; metal, 195; metal, coating types, 196; metal, coatings properties, 195; metal, equipment and mechanics, 195; metal, preparation effect on fatigue, 299; metal, study, 94
Spring Steel, for watches, 201
Springs, metals for, 391; shot-peening effect on fatigue, 197
Stainless Steel, cladding on low-carbon steel, 201; corrosion by alkali chlorides, 394; corrosion-pitting effect of dissolved gases, 205; corrosion resistance in acid, 206; deformation in, 299; determination of niobium in, 396; extrusion for jet-engine rings, 191; intercrystalline corrosion testing by sound, 205; passivity phenomena, 205; powder compacts, 386; powder production by electrochemical method, 386; powder production from scrap, 196; precipitation hardening, 200; properties, 198; review, 200; rolling-defects inhibition by rare-earths, 200; scrap remelting in open-hearth, 184; sheet radial forming, 292; sigma phase, 203; sigma-phase effects, 391; soldering and welding, 294; stress indication by hydrogen selenide, 389; tube-extrusion press, 91; welding, 294; welding, corrosion-resistance maintenance during, 193; X-ray fluorescent analysis, 102; *See also* Chromium, *etc.*, Steel
Stamping, 91, 191, 292, 382; die, precision, 382
Statistical Analysis, automatic data handling by teleprinter technique, 358 (*Letter*); of cast-iron analyses, 206; of fatigue, 197; metalworking variability assessment, 102
Steam, heat-treatment in, 90
Steam Plant, corrosion inhibition by amines, 100; efficiency research, 84; operation at Consett, 174; steels for, 391; steels testing, 199; waste-heat recovery, 271 (*Paper*)
Steel, alloy. *See* Alloy Steel; bearing, 197, 290; Bessemer. *See* Bessemer Steel; bluing in alkaline media, 384; boron, 200, 201; cast. *See* Cast Steel; chromium. *See* Chromium Steel; clad. *See* Clad Steel; continuous casting, 87, 188, 290; deoxidation with Cu–Mg alloy, 380; determination of Al, Al_2O_3, and AlN in, 396; determination of carbon in, 396; determination of carbon in trace amounts in, 302; determination of gases in, 390; determination of hydrogen in, 396; determination of manganese in, 396; determination of nitrogen in, 396; determination of oxygen in, 396; determination of phosphorus by spectrography, 302; determination of silicon by rapid method, 396; determination of silicon in small amounts by photometry, 302; determination of silicon by spectrophotometry, 302; determination of sulphur by BaCl method modification, 206; die, 200; effects of V and Mn, 200; electric. *See* Electric Steel; galvanized, 297; heat-resistant. *See* Heat-Resisting Steel; high-speed. *See* High-Speed Steel; high-strength, literature review, 200; hydrogen blistering, 101; inclusions. *See* Inclusions; magnetic, shell moulding, 89; manganese. *See* Manganese Steel; martensitic, 198; mild. *See* Mild Steel; molybdenum. *See* Molybdenum Steel; nickel. *See* Nickel Steel; non-magnetic, brass replacement by, 300; non-metallic inclusions. *See* Non-Metallic Inclusions; oxygen pick-up, 290; pearlitic, 198; production, 86, 184, 288, 380; production data, 102, 397; production data for Britain, 102; production by oxygen lancing in ladle, 187; razor-blade, cold-rolling and annealing effects, 300; sheet. *See* Sheet Steel; silicon, subcritical decomposition of carbide phase, 249 (*Correspondence*); sorting by magnetics, 96, 300, 389; special. *See* Special Steels; spring. *See* Spring Steel; stainless. *See* Stainless Steel; structural. *See* Structural Steel; structure and properties, 100; tool. *See* Tool Steel; transformer. *See* Transformer Steel; wire. *See* Steel Wire
Steel Bars, bright, production, 382; forging plant, 292; solidification, effect of chills, 90
Steel Blooms, shearing shock fatigue, 92; surface defects, 382
Steel Castings, mould-material heat transfer, 88; plate, 89; pouring-temperature effects, 88; solidification in sand and chill moulds, 381; solidification in various moulds, 90
Steel Company of Canada, plant extensions, 184
Steel Company of Wales, Ltd., melting-shop starting and operating experiences at Abbey, 46 (*Paper*); oxygen applications, 184
Steel Industry, Japanese expansion, 397
Steel Plates, boiler, cracking, 197; casting in surface-hardened condition, 89; load-deflection equation, 298; stress determination by layers removal, 96; welds shot peening, 194
Steel Strip, descaling by temper mill, 192; enamelled, flexure and fracture, 94; galvanizing line, 94; galvanizing Sendzimir line, 94; heating methods comparisons, 189; rolling, 293; thin, residual-stress determination in lightly rolled state, 23 (*Paper*)
Steel Tubes. *See* Tubes
Steel Wire, annealing and patenting baths, 191; plating before galvanizing, 195; production practice and control, 191; spring, 391
Steelmaking, at Gerlafingen, 380; lime-properties effects in, 378; oxygen in, 184
Steelworks, auxiliary-motors standardization, 383; Bessemer, for L.D. process, 87; Bessemer, layout and construction, 380; boiler-plant waste-heat recovery, 271 (*Paper*); electrical equipment, 192; heating and ventilation problems, 398; materials management department, 207; melting-shop starting and operating experiences at Abbey, 46 (*Paper*); traffic, 207; variable-speed couplings in, 293; water-supply system, 102
Stewarts and Lloyds, Ltd., pelletizing of Northampton sand ironstones by vacuum extrusion, 265 (*Discussion*)
Strain, energy, 99; forgings properties dependence on, 250 (*Paper*); stress relationships in pressure vessels, 200; stress relationships in wire drawing, 299; thermal cyclic, 390; torsion effects, 387
Strain Gauges, electronic type, 388; silver-plated slip rings in circuits, 95
Stress, creep effects in gas-turbine rotors, 390; creep residual, 199; determination by X-rays, 99; fatigue relationship with, 95; in flame hardening, 190; in hot tearing, 97; intermittent, creep in, 97; residual, determination by hydrogen selenide, 389; residual, determination by layers removal, 96; residual, determination in lightly rolled thin strip, 23 (*Paper*); residual, effect on fatigue, 197, 388; residual, in metals and metal construction, 399 (*Book*); residual superficial, determination, 299; rupture, of nodular iron, 390; static, effect on damping, 391; strain relationships in pressure vessels, 200; strain relationships in wire drawing, 299; tensile, austenite transformation in, 393; in thermal creep, 199; thermal cyclic, 390; thermal cyclic, test apparatus, 390; in vapour-phase films, 296; weld, measurement by trepanning, 93
Stress Analysis, brittle-coating crack density as index, 95; by layers removal, 96; photoelastic. *See* Photoelastic Analysis; in plastic flow, 96; by trepanning, 93; by vitreous-enamel coatings, 95
Stress Corrosion, cracking, effect of stress relief of weldments, 206; cracking of mild steel, 101
Stress Relief, of fractionating column, 291; weld, by induction heat-treatment, 383; weld, by oxy-acetylene flames, 291, 383; weldments, effect on stress-corrosion cracking, 206
Structural Steel, galvanized, inspection, 297
Studebaker Corp., forging jet-engine parts, 91
Sulphur, in blast-furnace slag and slag wool, 86; corrosion of iron by, 100; determination by BaCl after chromatographic removal of H_2SO_4, 206; determination in solid fuels, 206; effect on forgeability, 292; Fe–O system with, 290; partition between gas, slag, and metal phases in iron and steel making, 147 (*Paper*); removal in acid converter, 380; scaling by, 395; transfer across slag/metal interface, 184

Sulphur Dioxide, scaling by, 395
Sulphuric Acid, chromatographic separation preparatory to sulphur determination, 206; corrosion inhibition by diethylaniline in, 93; corrosion resistance of chromium steels in, 206; passivity in, 100
Supersonic Testing, applications, 199; crack detection, 96; crack detection by Sensometer, 96; developments in, 389; by Echotest and Porotest, 388; by Elektrofona, 388; of forging ingots, 198; instruments, 198; introduction to, 388; methods, 388; progress in, 199; pulsed instruments, 388; by Sonometer, 388; techniques, 198; visual methods, 388; welds, 390
Supersonics, cleaning by, 93; corrosion assessment by, 302; drilling by, 194; equipment for, 388; machining by, 194; thickness determination by, 302; wave propagation at surfaces, 390
Surface Finishing, colouring, 296; practice, 93; problems, 296
Surface Hardening, induction, 91; methods, 191; unit for, 91
Surfaces, castings, factors affecting, 381; deformation of iron crystals by unidirectional abrasion, 124 (*Paper*); electron emission from, 98; interferometer for, 388; layer-thickness determination by eddy currents, 389; preparation effect on fatigue, 299; preparation for metallography, 202; preparation for painting, 195; protection symposium, 195; rolling-temperature effects, 383; roughness determination of electrodeposits, 93; roughness determination on iron castings, 381; slip-band formation in deformation, 387; testing by optical instruments, 388; wear-resistant-layers formation by oxy-acetylene torch, 94
Sweden, gamma-radiography research, 300; grey-iron standardization, 97; iron and ingot-steel production, 86

Tanks, welding, 193
Tantalum, powder metallurgy, 384
Tar, asphalt mastic coatings, 298; coal, composition, 85; for converter linings, 86; dolomite mixtures for converter, 184, 380; specifications for roads, 85
Tarmacadam, specifications, 85
Television, in works communications, 207
Temper Brittleness, in Cr–Mn steels, 198; effect of temperature, 197; hardness relationship with, 198; in nodular and blackheart irons, 202
Temperature Measurement, 85, 182, 286, 378; boiler exit gas by suction pyrometer, 379; by immersion pyrometers, 286; instruments and scales, 379; instruments standardization in Germany, 182; by needle-type thermocouple, 182; pyrometers, radiation-types, 182; recorders selection, 182; by sheathed thermometers, 389; thermocouples, Pt–Rh life, 379
Temperature Measurement and Control, 85, 182, 286, 378; micro-thermostat for X-ray work, 203; in open-hearth by Russian instruments, 184; of plating vats, 296; in vitreous enamelling, 182
Tempering, austempering of high-speed steels, 202; austempering thin parts, 381; austenite hardening by, 204; creep relationships, 382; effect on Cr-steel corrosion resistance, 394; isothermal, 190; phenomena, 189; structural changes in Fe–C alloys, 392; temperature effect on yielding, 387; transformations in high-speed steel, 99
Tensile Tests, deformation micro X-ray study, 393; grey-iron, effect of graphite-flake size, 97; on high-purity Fe–Si, Fe–Ni, Fe–Cr, and Fe–Mo alloys, 163 (*Discussion*); high-temperature effect, 199; loading-rate
Tensile Tests—*Continued*
effects in torsion, 387; machine for, 298; on martensites, 391; micro-machine graphs evaluation, 387; on nodular iron, 201; notched-bar, for brittle strength, 197; relationships with long- and short-time creep of a commercial alloy, 105 (*Paper*); short-term load behaviour in, 387; small flat specimens preparation, 196
Testing, 95, 196, 298, 387; boron steels, 200; cast-iron toughness, 201; cathodic protection, 394; chromium-plate adhesion, 296; coal softening, 85; copper–lead powders for bearings, 387; enamelled-sheet bending, 196; galvanized-coatings uniformity, 297; grey-iron castings, 291; grey-iron fluidity, 89; iron oxides porosity, 100; limestone, 378; liquid-iron fluidity, 89, 185; lubricants, 294, 383; moulding sand, 187; moulding-sand hardness, 187; moulding sand under load, 187; nickel-plate adhesion, 295; nodular iron, 201; paint durability, 301; porcelain-enamel abrasion, 196; porcelain-enamel torsion, 196; in powder metallurgy, 384; quenching media, 292; sinter, 83, 84; spot welds, 295; steam-plant steels, 199; surfaces by optical instruments, 388; tin-coating porosity, 94; titanium alloys containing cobalt, 387; weld cracking, 193; weld hot cracking, 194; weldability, rapid dilatation, 353 (*Discussion*); welded structures by notch bend, 194; welding electrodes, 193; wire bending, 298
Testing Machines, bend, for wire, 298; creep, 95; Deltameter, 197; fatigue, 96; hardness, Leitz-type, 198; hardness, for wire, 198; Rockwell error-free, 198; tensile micro-Chévenard graphical evaluation, 387; tensile universal, 298; universal, for large structures, 197
Tests, 95, 196, 298, 387; adhesion, of chromium plate, 296; adhesion, of nickel plate, 295; bend, on enamelled sheet, 196; bend fracture, on bearing steel, 197; bend, on nodular iron, 201; bend, on wire, 298; brittle fracture, 197; coking, 286, 373; corrosion, 205; corrosion electrochemical, 205; corrosion fretting, 101; corrosion-inhibition for oil and gas wells, 101; corrosion intercrystalline, by sound, 205; corrosion, by nitric acid method, 206; corrosion, reproducibility, 301; creep data interpretation, 95; creep long-term, 97; creep machine, 95; deep-drawability, of sheet steel, 170 (*Discussion*); electrical. *See* Electrical Testing; electro-acoustic, 389; explosion, hardness plateaus and twinning in, 387; fatigue, effect of cyclic speed, 390; fatigue, effect of specimen size, 197; fatigue, fixtures for, 299; fatigue machine, 96; fatigue progressive-load, 96; fatigue Prot-type, 96; fatigue rapid routine, 96; fluidity, of grey iron, 89; fluidity, of liquid iron, 185; fluorescent iridium, 198; fretting-corrosion, 101; hardenability with eccentric specimen, 382; hardenability end-quench, 292; hardness, Brinell correlations in grey iron, 200; hardness, cone-indentation study, 198; hardness machine, 198; hardness micro conditions and preparation, 300; hardness micro/macro relations, 299, 300; hardness Rockwell error-free machine, 198; hardness, on sand moulds, 187; hardness, on wire, 198; impact. *See* Impact Tests; magnetic. *See* Magnetic Testing; notch-bend, of welded structures, 194; notched-bar, for brittle fracture, 197; porosity, of iron oxides, 100; porosity, of tin coatings, 94; ring crushing, 197; strength, 298; supersonic applications, 199; supersonic crack-detection, 96;
Tests—*Continued*
supersonic developments, 389; supersonic, of forging ingots, 198; supersonic instruments, 96, 198, 388; supersonic, introduction to, 388; supersonic methods, 198, 388; supersonic, progress in, 199; supersonic, visual methods, 388; supersonic, of welds, 390; tensile. *See* Tensile Tests; terminology of, 387; torsion, of porcelain enamels, 196; torsion, temperature and strain-rate effects, 387; toughness, on cast iron, 201; wear, 198; wear, of porcelain enamels, 196; weldability, rapid dilatation, 353 (*Discussion*)
Thermodynamics, data calculation, 204; laws re-evaluation, 397
Thomas (Richard) and Baldwins, Ltd., oxygen applications, 184
Time Study, MTM method in foundry, 89; "worth" and "weighting" in, 398
Tin, as coating material, 94; corrosion protection by, 205; electrodeposition, 94
Tin Alloys, electrodeposition, 94
Tin Research Institute, tin-alloy electrodeposition research, 94
Tinning, electrolytic, 94; hot-dip, 297
Tinplate, corrosion, 94; greyness in, 195; plant lubrication, 193; tin–lead alloys removal from, 94; water demineralization plant for, 297
Titanium, effects on chi- and Laves-phase formation, 393; passivity in H_2SO_4, 100; powder sinterings, 387
Titanium Alloys, cast, properties, 301; powder sinterings, 387
Titanium Carbide, cobalt-containing, testing, 387; creep strength, 387; sintered alloys, 387
Tool Steel, heat-treatment, 190; production and characteristics, 102; quality control, 87; quality developments, 185; scrap utilization, 295; unalloyed, 391
Tools, cutting. *See* Cutting Tools; etching by electric spark, 392
Toughness, cast irons, 201; notch-impact, effect of temperature, 197
Traffic, iron and steel works, 207
Transformer Steel, sheet watt-loss determination errors, 96
Tropenas (A.), life and work, 102
Tubes, extrusion press, 91; galvanized, uses, 297; galvanizing, 297; galvanizing pretreatments, 297; internal nitriding with high-pressure N, 191; rolling-blank cracks, 293; rolling in piercing mill, 293; small-diameter, production, 292; stainless, nitriding, 191; welded, skelp heating-furnace burners, 381
Tungsten Alloys, cast, properties, 301; powder-metallurgy developments, 387
Tungsten Carbide, cobalt-containing, effect of carbon, 387; hard facing by granules, 194
Turkey, chromite deposits, 284

United States, basic-point pricing in iron and steel industry, 304 (*Book*); Bessemer L.D. process prospects, 288; blast-furnace aspects, 379; coke and ore considerations, 379; early ironworks plantations, 102; iron-ore shipment from Quebec-Labrador, 377; magnetite deposit of New Jersey, 377; magnetite deposit of Pennsylvania, 377; mineral resources of eastern states, 181; old Saugus ironworks restoration, 102; research organization, 398
United States Bureau of Mines, blast-furnace-model trials, 288
United States Steel Corp., Carilloy steel, 201; Fairless plant, 184; fork trucks at Lorain, 192; nitriding process, 91; sinter quality control, 284
United Steel Companies, Ltd., Fortiweld steel, 200, 201
Units, French and international summary, 398

Uranium, in heat-resisting alloys, 347 (*Paper*)

Vacuum Melting, furnaces at B.I.S.R.A., 187
Vanadium, effect in Cr die steel, 200; recovery from liquid pig iron, 183
Vanadium Alloys, cast, properties, 301
Vanadium Pentoxide, corrosion by, 206; corrosion by in gas turbines, 394; corrosion by in gas turbines, effect of alloy composition, 241 (*Paper*); liquidus of metal-oxide systems with, and mechanism of attack by, 342 (*Paper*)
Vauxhall Motors, Ltd., Cr–Ni plating, 94
Ventilation, crane cabs and pulpits, 193; foundry, 188; steelworks, 398
Vereinigte Österrische Eisen und Stahlwerke, A.G., LD steel acceptance tests, 97
Vibration, measurement, 102
Viscosity, liquid-metal, as phenomenon of intercrystalline mutations, 185

Waste Liquors, determination of Fe, Cu, and Ni in, 396; treatment and disposal, 383
Water, analysis for corrosion activity, 205; boiler specifications, 207; corrosion by, 205; corrosion in oil refineries by, 206; demineralization plant, 297; treatment for cooling towers, 206
Wear, hot, hard facing for resistance, 194; micro surface cracking by, 93; porcelain-enamel, 196; protection by chromizing, 195; resistant-layers formation by oxy-acetylene torch, 94; resistant-materials selection, 198; surface-protection symposium, 195; testing, 198; testing porcelain enamels, 196; unidirectional, deformation of iron crystals by, 124 (*Paper*)
Weld Metal, porosity and cracking, hydrogen effects in Unionmelt process, 92; stainless, sigma phase in, 203
Weldability, 207 (*Book*); assessment by rapid dilatation tests, 353 (*Discussion*); B–Mo steel, 193; nodular iron, 193
Welded Assemblies, corrosion in, 395; stress-relief, effect on stress-corrosion cracking, 206
Welded Structures, fatigue resistance, 388; testing by notch bend, 194; transformation-diagram application in fabrication, 204
Welding, 92, 193, 294, 383; arc research, 294; argon-arc, 294; armoured vehicles, 193; B–Mo steel, 193; butt, consumable insert in, 294; butt, by foil process, 193; cast-iron rolls, 295; in chainmaking, 193; dissimilar metals, 294; hard facing. *See* Hard Facing; heat-resisting steel, 294; Heliarc, 294; hydrogen, in chainmaking, 193; manganese steels, 294; metallurgy of, 294; Nertalic-Aircomat, 294; nodular iron, 294; pipemaking-plant layout for, 383; Plurial, 294; processes and control, 207 (*Book*); resistance, cinematographic study, 294; rolls refacing by, 295; sheet by foil-butt process, 193; sigma, 294; stainless steel, 294; stainless steel corrosion-resistance maintenance in, 193; in steelworks maintenance, 295; Unionmelt, bead porosity and cracking in, 92
Welding Electrodes, classification symbols, 93; coating with iron powder, 295; metal-arc, 383 (*Book*); testing, 193
Welding Research Council, peening study, 194
Welds, arc, inclusions in, 93; butt, thermal-activation effect on fatigue life, 295; cracking, hot tests, 194; cracking, hydrogen effects in Unionmelt process, 92; cracking test, 193; flash, cooling rates, 294; groove, cracking test, 193; heat-affected-zone graphitization, 93; mild-steel, test, 193; nondestructive testing, 389; radiography, 198; shot-peening studies, 194; spot, testing, 295; stress measurement by trepanning, 93; stress relief by induction heat-treatment, 383; stress relief by oxy-acetylene flames, 291, 383; testing cracking, 193; testing mild-steel, 193; testing non-destructively, 389; testing spot; testing by ultrasonics, 390; X-ray testing, 389
Wheeling Steel Corp., galvanizing line, 94; Steubenville plant, 288
Wheels, pressure casting, 187
White Cast Iron, annealability, effects of oxygen, 187; cooling cracks, 188
Whitehead Iron and Steel Co., Ltd., cold-strip mill, 293
Williams Prize, award for 1954, 373
Wire, annealing furnaces, 191; annealing and patenting baths, 191; bend tests, 298; damping static-stress effects, 391; galvanized-coating uniformity test, 297; galvanizing-bath composition, 297; galvanizing continuous process, 297; galvanizing and patenting frames, 296; hardening technique, 388; hardness tester, 198; quality control, 191; rolling spread, 192; tension measurement for concrete reinforcement, 299
Wire Drawing, back-pull machine, 191; die profiloscope, 192; die research review, 92; by double-holing machines, 191; effect on stress/strain curve, 299; multi-hole slip-cone machines, 382; practice, 92; rate effects in stainless steel, 192; rods descaling for, 194; Spanish terms in, 382; stainless steel, rate effects, 192; theory and formulæ, 382
Wire Ropes, lubrication testing, 294
Wüstite, inclusions in iron, 162
Wyman-Gordon Co., heavy press, 91

X-Ray Studies, Cr–Ni steel, 240 (*Appendix*); iron and nickel symmetries, 203; micro, of tension-deformed Al and Fe, 393
X-Rays, camera, 98; detector, 96; diffraction photography at low temperatures, 98; diffuse-scattering relationships with crystals properties, 204; equipment for, 389; fluorescent-analysis symposium, 102; Geiger-counter diffractometer, 203; line broadening by cold work, 393; micro-thermostat for, 203; powder-pattern split-image film comparator, 203; powder-pattern standards, 203; single-crystal surface examination method, 203; spectrographic-analysis symposium, 102; spectrometer with linear motion, 302; stress determination by, 99; weld testing, 389

Yield Point, effect of hydrogen, 390; effects of strain rate and temperature, 387; of hardened steel, 387; in short-term loading, 387; slip process in, 299
Yorkshire Electricity Board, industrial tariff, 279 (*Appendix*)
Young's Modulus, determination by electro-acoustics, 389
Yugoslavia, magnetite deposits, 181; mineral resources, 83

Zinc, impurities effects in galvanizing, 296; liquid, attack on iron, 101; liquid, attack on iron in presence of Sb, 101; passivity in relation to aeration, 205
Zinc Coatings, structure assessment, 296
Zinc Plating, cartridge cases, 195; propeller blades, 297
Zirconium, powder metallurgy, 384

NAME INDEX

Abe, F., K. Kimura, and **T. Saito,** stainless-clad mild steel, 201
Aborn, R. H., stainless steels, 200
Abram, T., coking, 85
Adachi, H. *See* Sasaki, S.
Adam, J., X-ray camera, 98
Adams, C. M., jun. *See* Bhattacharya, U. K., *also* Powell, R. G.
Adams, W. H., elected Member, 210
Adams, W. R. *See* Barlow, T.
Adler, A., stainless powder, 196
Agar, J. N. *See* Davies, D. E.
Agarwala, R. P., biographical note, 176
Agarwala, R. P., and **H. Wilman,** *Paper*: "Deformation of Iron Crystals by Unidirectional Abrasion," 124
Aikman, A. R., J. McMillan, and **A. W. Morrison,** sheathed thermometers, 378
Ainsbury, D. W., hoop mill at Barrow, 293
Akutagawa, T., and **T. Fujita,** V_2O_5 attack in gas turbines, 206
Albers, H., G. Krause, and **A. Greensite,** extrusions, 191
Alf, A., weld induction heat-treatment, 383
Alfort, S., P. Bane, G. Ekwall, G. Tengstrand, and **P. Å. Wallgren,** long-term corrosion tests in Sweden, 301
Allard, M., IRSID, 207
Allen, L. N., jun., manganese recovery from low-grade ores, 285
Allen, N. P., and **W. E. Carrington,** creep tests on heat-resisting metals, 199
Allender, P. J., elected Member, 210
Allison, A., graphitization of steel at sub-critical temperatures, 319
Allison, E. B., and **P. Murray,** sintering mechanism, 298
Allsop, H., continuous cooling of steels, 354
Allten. A. G., Fe–Cr–Mo–Ni sigma phase, 301
Alves, A. C. T., elected Member, 210
Ambs, H. D. *See* Lenel, F. V.
American Foundrymen's Society, gates and risers nomenclature, 89
American Society for Metals, microstructure symposium, 98
American Society for Testing Materials, fatigue-statistics symposium, 197; non-destructive-testing symposium, 198; porcelain-enamels and ceramic-coatings symposium, 196; X-ray fluorescent spectrographic - analysis symposium, 102
Amiot, P. *See* Bastien, P.
Ammareller, S., elected Member, 210
Anderson, C. T., V. V. Donaldson, R. W. Kimball, and **F. R. Cattoir,** forgeability of Mn- and S-containing steels, 292
Ando, T. *See* Yoshizaki, K.
Andreini, A. *See* Sandrinelli, R.
Andrejew, L., hardening cast-iron rolls, 189
Andrew, K. F. *See* Gulbransen, E. A.
Andrews, A. S. *See* Cox, J. E.
Andrianov, M. I., tools chromium plating, 195
Angles, R. M. *See* Britton, S. C.
Apblett, W. R., and **W. S. Pellini,** weld hot cracking, 194
Apps, D. S., elected Member, 210
Appun, J. *See* Pahlitzsch, G.
Apraiz, J., temperature measurement, 379
Arant, N. R. *See* Orehoski, M. A.
Arata, Y. *See* Okada, M.
Aravamuthan, V., iron powders, 298
Ardmongon, S., elected Associate, 210
Ariga, K. *See* Yoshizaki, K.
Arndt, U. W., X-ray detector, 96
Arpi, R. *See* Rudberg, E.
Arthur, J. R., and **D. T. A. Townend,** hydrogen reactions in flames, 84
Ash, A., elected Member, 210
Ashby, R. H. *See* Niklewski, B. K.
Ashley, E. C. *See* Jacobs, F. W.
Ashton, M. D., biographical note, 175
Aso, M. *See* Takaki, H.
Aspin, B. T., *Book*: "Foundrywork for the Amateur," 398
Association of Iron and Steel Engineers, skelp-heating burners, 381
Astier, J. E., iron-ore pelletizing, 268
Åström, H. U., and **G. Borelius,** nitrogen solubility in α-iron, 301
Atkinson, T. H., and **W. P. Thompson,** salt-bath furnace, 189
Atta, F. Van. *See* Van Atta, F.
Atterton, D. V., and **C. Edmonds,** exothermic materials in foundry, 187
Attia, Y. G., D. Fitzgeorge, and **J. A. Pope,** creep-stress study, 199
Audubert, R., Jeanne Pérard, and **Thérèse Mallet,** electrolysis study by radio-isotopes, 296
Ault, G. M. *See* Francisco, A. C.
Averbach, B. L. *See* Fiedler, H. C., *also* Lement, B. S.; Muir, H.
Avery, H. S., hard facing, 194; hard-facing alloys, 195; hard facing with chromium carbide alloys, 195; hard facing with cobalt-base alloys, 195; hard facing for hot wear resistance, 194; hard facing with nickel-base alloys, 195; hard facing with tungsten carbide granules, 194; manganese steels, 198; martensitic irons, 198; martensitic and pearlitic steels, 198; stainless steels, 198; wear-resistant materials selection, 198; wear testing, 198
Aymá, F. J., sigma-phase identification, 392
Azarov, K. P., base enamels for steels, 94
Azou, P. *See* Bastien, P.

Baake, R., H. Eisenrich, and **K. Schröder,** low-nitrogen Bessemer-steel production factors, 288
Baas, G. *See* Rathenau, G. W.
Babb, A. L. *See* Johnson, P. A.
Babcock, R. S., oxygen and powder cutting, 295
Bablik, H., galvanizing of tubes, 297
Bach, B. B., oxygen in cast iron, 97
Bacon, N. P., elected Member, 210
Badlam, S., Japanese steel industry, 397
Baffrey, A. R., induction hardening, 190
Bagchi, T. C. *See* Ghosh, J. C.
Bailey, E. T. W., expansions at Steel Company of Canada, 184
Bailey, S. B., nodular iron, 88
Baker, S. C., direct-reading D.C. arc spectroscopy, 102
Bala, S. *See* Wusatowski, Z.
Baldwin, A. T. *See* Passolt, H. H.
Baldwin, B. G., *Paper*: "The Formation and Decomposition of Hercynite ($FeO.Al_2O_3$)," 142; *Paper*: "The Mechanism of the Reduction of Iron Oxides by Solid Coke," 30, *Corrigendum*, 283
Baldwin, W. M., jun. *See* Brown, J. T.
Balezin, S. A., and **G. S. Parfenov,** inhibitors effects on steel corrosion in nitric acid, 395
Ball, F. A., and **D. R. Thorneycroft,** arc welding nodular iron, 294
Ballay, M., work of C.T.I.F., 291
Ballay, M., and **J. Grilliat,** tests for nodular iron, 201
Ballesteros, A. G., elected Member, 210
Balsley, J. R. *See* Hawkes, H. E.
Bamforth, A. W., corrosion in ammonium sulphate plants, 205
Bane, P. *See* Alfort, S.
Bangert, L. *See* Koster, W.
Baque, H. W. *See* Hand, T.
Barbazanges, C. *See* Tagliaferri, A.
Barber, R., R. Jackson, T. Land, and **G. G. Thurlow,** suction pyrometer, 379
Barbier, G., and **S. Trocme,** fertilizing action of granulated slag, 183
Bardgett, W. E., brittle fracture in low-alloy steels, 165; weldability dilatation tests, 354
Bardgett, W. E., and **M. G. Gemmill,** *Paper*: "Causes of Variable Creep Strength in Basic O.H. Carbon Steel," 211
Bardin, I. P., and **M. Ya. Ostroukhov,** blast-furnace-bosh reactions, 380
Bardócz, A., spectrographic spark source, 302
Bardolle, J., and **J. Moreau,** electrolytic etch, 98
Barlow, D. A., deep-drawing properties of sheet steel, 172
Barlow, T., and **W. R. Adams,** high-pressure moulding, 89, 188
Barnard, K. N., cathodic protection of ships, 100
Barnes, B. D., and **H. E. Raaflaub,** soaking-pit plant, 189
Barnes, R. S., dislocations climb, 203
Bartholome, W. *See* Schepers, A.
Bashforth, G. R., casting-pit refractories, 287
Bastien, P., physics in iron and steel industry, 207
Bastien, P., and **P. Amiot,** structure and hydrogen embrittlement, 391
Bastien, P., P. Azou, and **Christiane Winter,** effect of cold-introduced hydrogen in cast iron, 200
Bastien, P. G., ultrasonic testing, 198
Batchelder, F. W. von. *See* von Batchelder, F. W.
Bates, L. F., domain structure of ferromagnetic materials, 203
Bauer, W. G., calciner-heat control, 285
Baxter, J. R., and **A. L. Roberts,** metal/ceramics from metal oxide systems, 387
Bayoumi, S. E. A. *See* Lamble, J. H.
Beach, A. B., and **R. W. Heine,** graphitization of Fe–Ti–C alloys, 100
Beach, L. A., R. B. Theus, and **W. R. Faust,** X-ray penetration in iron, 389
Beams, J. W., single-crystal rotors, 393
Beattie, H. J., jun. *See* VerSnyder, F. L.
Beaudet, E. C., extrusion press, 91
Beck, P. A. *See* Greenfield, P.
Becker, H., cast-iron rolls repair by welding, 295; steel rolls repair by welding, 295
Becker, K. *See* Matting, A.
Becker, M. L., diffusion of nitrogen in iron, 351
Bedier, R. *See* François, J.
Bekaert, L., Belgian iron and steel industry, 207
Belevtsev, Ya. N., and **R. P. Dubinkina,** Krivoi Rog ores, 83
Bell, G. R., testing metal powders, 384
Bell, Winifred A., laboratory plating with manganese, 195
Bendure, R. J., Huey nitric acid test, 206
Benedict, W. S., and **E. K. Plyler,** hydrocarbon-flames infra-red spectra, 84
Benesovsky, F. *See* Kieffer, R.
Benson, G. J., special-pipes production, 89
Beretta, G. *See* Donati, E.
Berger, G., and **A. Bolin,** feeder-heads solidification, 188
Bergh, A. W. J. van den. *See* van den Bergh, A. W. J.
Bernard, M., slag control in basic open-hearth, 289
Berner, L., bearing lubrication, 294
Bernstein, J., whiteheart malleable castings production, 186
Berthold, R., radiography, 388
Bertocci, U., inorganic corrosion inhibitors, 205

Best, G. E., and **E. A. Roche,** sodium chromate as corrosion inhibitor in anti-freeze mixture, 395
Bever, M. B. *See* Clarkin, P. A.
Bever, M. B., and **C. F. Floe,** case hardening by carbonitriding and cyaniding, 190; case hardening by carburizing, 190; case hardening by nitriding, 191, 382; diffusion treatments for wear protection, 195
Bhattacharya, U. K., C. M. Adams, jun., and **H. F. Taylor,** hot-tearing stresses, 97
Bhattacharyya, S., and **G. L. Kehl,** austenite transformation under stress, 393
Bianchi, G., corrosion testing and control, 205; passivity of zinc, 205; tin coatings, 94
Bighi, C., dissolved-gases effect on pitting of stainless steels, 205
Bighi, C., and **G. Mantovani,** pigments testing, 205
Bigos, J., painting specifications, 196
Billington, A. H., chemical pretreatment of coal, 85
Binder, W. O. *See* Franks, R.
Bingham, H. L., machining lubricants, 294
Bining, A. C., early U.S. iron plantations, 102
Birks, L. S. *See* Friedman, H.
Bishop, H. F. *See* Johnson, W. H., *also* Morey, R. E.; Myskowski, E. T.
Bispham, T., and **F. R. Weston,** coke volatile matter, 85
Black, A. T. P., hydrogen welding in chainmaking, 193
Blackwell, J. A., tool-steel quality control, 87
Blainey, A., self-lubricating bearing materials, 387
Blake, R. L. *See* Pfleider, E. P.
Blakely, T. H. *See* White, A. E. S.
Blank, E. M., casting surface-hardened plate, 89
Blaschke, W. S. S., flat-field microscope objective, 98
Bleimann, F., waste-heat recovery from rolling mills, 90
Bloch, P. K., ultrasonic testers, 198
Blondel, A., and **P. Broquet,** gamma radiography with cobalt, 199
Bockrath, J. H., surface-hardening unit, 91
Boddey, R. F., elected Member, 210
Bodenlos, A. J., Brazilian magnesite deposits, 377
Boettcher, A., R. Thun, and **H. Treupel,** electron-diffraction camera, 393
Böhm, J., rolls induction hardening, 190
Bolin, A. *See* Berger, G.
Bolognesi, G. P. *See* Indelli, A.
Bol'shakov, I. F., and **T. M. Smirnov,** metal shrinkage and growth determination apparatus, 199
Bombara, G., inhibitors evaluation by polarization curves, 205
Bonetti, J. M. *See* Peck, C. F., jun.
Boni, B., early Italian cannon foundry, 397
Bönnhoff, H., temperature recorders, 182
Borcherdt, E. R., detachable drill bits, 284
Borelius, G. *See* Åström, H. U.
Born, K., inclusions in arc welds, 93
Borstner, J., elected Member, 210
Bose, B. N. *See* Schrader, H.
Bostandjis, H. M., elected Member, 210
Boulger, F. W., and **R. H. Frazier,** effects of C and Mn on semi-killed hot-rolled steels, 97
Boulin, R. *See* Desguin, R.
Boussard, F., sand stripping test, 187
Boutigny, R., heat-treatment in gas, 189
Bowden, J. S. *See* Merriman, A. D.
Bowker, P. H., elected Associate, 210
Boyd, F. C., cold heading, 191
Bozorth, R. M. *See* Nesbitt, E. A., *also* Williams, H. J.
Bradbury, B. T., elected Associate, 210
Braddon, G., air preheaters, 378
Bradley, D. E., vapour-carbon replica technique, 392
Brandes, E. A. *See* Sully, A. H.
Brandes, G., elected Member, 210
Brandi, H., basic-converter process development, 380; elected Member, 210
Brandstaetter, F., magnetic studies of plastically deformed Fe and Fe powders, 388
Brandt, C. C., and **P. Scarola,** rod mill at Bethlehem steel, 382
Brandt, D. J. O., and **W. S. Williams,** small-scale steel production by oxygen lancing in ladle, 187
Brandt, F. A., H. F. Bishop, and **W. S. Pellini,** solidification in sand and chill moulds, 90
Braumann, F., and **H. Krächter,** nitriding Cr–Mo–Ni tubes with high-pressure N, 191
Breitfeld, H., non-destructive testers, 388; *see also* Förster, F.
Brenner, W., jun. *See* Nusbaum, C.
Breunich, T. R., fatigue-testing fixtures, 299
Brick, R. M. *See* Green, H. T.
Briggs, C. W. *See* Locke, C.
Brillié, J., Nertolic-Aircomatic welding process, 294
Brind, J. W., armoured vehicles, 193
Brisby, M. D. J., and **W. O. Pendray,** *Paper*: "The Supply of Scrap to Open-Hearth Furnaces," 252
Brissey, R. M., H. A. Liebhafsky, and **H. G. Pfeiffer,** X-ray emission spectrography, 102
British Iron and Steel Federation, sinter, 84
British Iron and Steel Research Association, (Ingots Committee) *Paper*: "Effect of Temperature and Pouring Speed on Ingot Structure," 120; (Methods of Analysis Committee) *Paper*: "Determination of Silica in Ores, Slags, and Refractories," 336; works-transport conference, 207
Brittain, C. P., and **G. C. Smith,** effect of annealing on electrodeposited chromium, 296
Britton, O. J. *See* Sanford, E. A.
Britton, S. C., tin in corrosion protection, 205
Britton, S. C., and **R. M. Angles,** corrosion tests on Sn–Ni and Ni–Cr coatings, 395
Broida, H. P., OH rotational intensities in flames, 84
Brooks, E. J. *See* Friedman, H.
Broquet, P. *See* Blondel, A.
Brown, D. J., magnesium powder metallurgy, 387
Brown, D. J., and **H. G. Smith,** coal flotation rate, 378
Brown, F., graphite nucleation and growth in steel, 203
Brown, H., carbides in Cr–Ni steel, 203
Brown, J. T., and **W. M. Baldwin, jun.,** hydrogen embrittlement, 199
Brown, R. H. *See* Sully, A. H.
Brown, R. J., continuous cooling of steel, 356
Brown, R. L., J. D. Davis, D. A. Reynolds, and **F. W. Smith,** tested coking coals index, 286
Brownlee, L. D., R. Edwards, and **T. Raine,** effect of C in WC–Co hard metal, 387; sintering-furnace atmospheres, 386
Brucart, R. B., gas producers, 378
Brunot, A. W. *See* Miller, R. C., jun.
Bryant, E. E., sheet strengthening by porcelain enamel, 196
Brzezinski, J., revolving foundry crane, 92
Buchanan, W. Y., balanced-blast-cupola practice, 186; borings and turnings melting in cupola, 186
Buchholtz, A., hard facing cast rails, 193
Buehl, R. C., small-scale-model blast-furnace, 288
Buelher, W. J. *See* Nachman, J. F.
Buey, oxygen-enriched-blast trials at Dilling, 288
Bühler, H., flame-hardening stresses, 190; shaft heat-treatment furnace, 190
Buisson, A., Newfoundland ore resources, 181
Bulakhova, P. A. *See* Usatenko, Yu. M.
Bungardt, K. *See* Scherer, R.
Bunin, K. P., and **T. M. Shpak,** graphitization of Fe–C, 204
Burghardt, O. *See* Goltz, A.
Burlingame, R. D., elected Associate, 210
Burton, E. J. *See* Williams, E. J.
Burton, N., obituary notice, 281
Busby, C. C., M. F. Hawkes, and **H. W. Paxton,** mechanical properties of martensites, 391
Busse, F., foil-butt seam welding, 193
Buxton, A., elected Associate, 210
Buzas, A., hydraulic presses, 292

Cain, F. M. *See* Padden, T. R.
Callahan, H. W., recarburizing furnace, 190
Campbell, J. B., properties and tests, 387
Campbell, W. E., fretting corrosion, 101
Campbell, W. J. *See* Carl, H. F.
Cardwell, A. B., photoelectric studies of iron, 394
Carl, H. F., and **W. J. Campbell,** fluorescent X-ray spectrographic analysis, 102
Carli, F. De. *See* De Carli, F.
Carlisle, S. S., automatic control systems, 184
Carlisle, S. S., and **J. R. Spencer,** multipoint recorder, 397
Carlson, E. E., elected Member, 210
Carlson, R. *See* Carter, S.
Carlsson, C. G., and **L. Danielsson,** spectrograph for P determination, 302
Carlström, C. G., gamma radiography, 199
Carr, A. L., nodular-iron mechanical properties, 202
Carrington, W. E. *See* Allen, N. P.
Carter, A. *See* Trent, E. M.
Carter, G. T., elected Member, 210
Carter, S., and **R. Carlson,** acid cupola melting variables, 88
Casas, J. M. F. *See* Mosquera, J. M. B. de C.
Case, S. L., D. D. Moore, C. E. Sims, and **R. S. Lund,** economic comparison of open-hearth and electric steelmaking, 185
Case, S. L., and **H. J. Grover,** selective heat-treatment, 191
Cass, F. H., N. L. Franklin, and **A. L. Roberts,** refractory recuperators, 285
Cassan, H., coal classifications, 285
Cassier, M. *See* Leroy, P.
Cataldi, H. A. *See* Dravnieks, A.
Cattoir, F. R. *See* Anderson, C. T.
Cavallaro, L., corrosion inhibitors, 205
Cavallaro, L., and **A. Indelli,** electrochemical testing, 205
Cazzaniga, L., continuous galvanizing of wire, 297
Cecil, F. E., elected Member, 210
Celli, A., galvanizing furnace, 297
Centro Ellettrochimica Associazione Italiana di Metallurgia, corrosion symposium, 205
Cerna, P. De. *See* De Cerna, P.
Chain, M., electric controlled-atmosphere furnaces, 91
Chakrabarti, S. K., elected Associate, 210
Chalmers, B., melting and freezing, 185
Chambadal, P., gas-turbine applications, 293
Chambers, L. F., costing in galvanizing, 297
Chambeyron, J., elected Member, 210
Chapman, R. D., and **W. E. Jominy,** cooling-transformation determination method, 394
Charbonnier, ingot-descaling machine, 185
Charrin, V., kieselguhr, 379; mineral resources of Vosges/Ardennes, 181
Chatterjee, B. *See* Das, P. P.
Chatterjee, G. P., hardness, 299; *see also* Chatterjee, S.
Chatterjee, G. P., K. C. Som, and **R. Ganguly,** anodic surcharging of carbon steel, 299
Chatterjee, S., and **G. P. Chatterjee,** mechanical properties of heat-treated steels, 298
Chenault, R. L., and **G. E. Mohnkern,** high-pressure nitriding, 91
Cherepanov, F. F., electric-spark etching of tools, 392

Chermin, H. A. G. *See* van Krevelen, D. W.
Chernyi, A. T., and **K. V. Podoinikova,** determination of Fe in roasted iron ores, 397
Chesters, J. H., aerodynamic aspects in open-hearth design, 289
Child, H. C. *See* Harris, G. T.
Chinnappa, K. V., spectrographic analysis of special alloys, 302; spectrographic index-point and line determination, 302
Chiotti, P., Geiger-counter X-ray diffractometer, 203
Chipman, J., award of Bessemer Medal, 372; biographical note, *facing* 304; *see also* Larson, H. R.
Chipman, J., J. C. Fulton, N. Gokcen, and **G. R. Gaskey, jun.,** silicon activity in liquid Fe–Si and Fe–C–Si, 301
Chotinuchit, P., elected Associate, 21
Chowdhury, K. P. R., and **R. Singh,** sillimanite refractories, 379
Christensen, N., gases in metals, 390
Christopher, C. F., pouring-temperature effect on steel castings, 88
Chu, G. P. K. *See* Keeler, J. H.
Cina, B., *Paper*: "The Metastability of Austenite in an 18/8 Cr–Ni Alloy," 230; award of Carnegie Medal, 373
Cina, B., and **J. D. Lavender,** *Appendix*: "High-Temperature X-Ray Diffraction Examination of an 18/8 Cr–Ni Alloy," 240
Cizeron, G., diffusion in sintering iron powders, 95
Clark, R. W., J. H. Fuller, and **J. A. Gleber,** lubrication, 193
Clarke, N. W. B., wire-tension testers, 299
Clarke, R. W., elected Associate, 210
Clarkin, P. A., and **M. B. Bever,** water vapour and ammonia in case-hardening atmospheres, 382
Clary, P. E., elected Member, 210
Clauser, H. R., high-temperature materials, 97
Clautice, W. E. *See* Ronay, B.
Cledwin-Davies, effect of grinding on fatigue strength, 388
Clift, A., galvanized tubes, 297
Clough, W. R., and **M. E. Shank,** density decrease in stressed nodular iron, 202
Cluett, A. R., metallography of cast irons, 203
Clydesmuir (Lord), obituary notice, 76
Coates, B., spring steels, 391
Cochardt, A. W., damping, 391
Coffin, L. F., jun., cyclic thermal stresses, 390
Coffin, L. F., jun., and **R. P. Wesley,** cyclic thermal stress apparatus, 390
Cohen, E. *See* Ridgeon, J. M.
Cohen, M. *See* Fiedler, H. C., *also* Lement, B. S.; Muir, H.; Roberts, E. C.
Coheur, P., and **H. Kosmider,** basic Bessemer process, 288
Cohn, C. C., finishing powder parts, 384
Cole, D. G., P. Feltham, and **E. Gillam,** grain growth, 99
Coleman, W. S., jun. *See* Mattson, R. L.
Collari, N., and **L. Foschini,** metal spraying, 195
Collaud, A., hardness relationships with other properties, 198
Collin, F. C., fluidized beds, 377
Collins, G. *See* Sugarman, B.
Collyer, D. B. *See* Wilder, A. B.
Colomb, F., lubricant additive, 294
Combert. *See* Leroy
Compostella, A. *See* Nanni, T.
Conard, G. P. *See* Libsch, J. F.
Congleton, J., elected Associate, 210
Constant, A., continuous cooling of steel, 356
Conway, J. B. *See* Wilson, R. H., jun.
Conwell, C. B., and **C. J. Stansfield,** zinc plating propeller blades, 297
Cook, E. G., and **H. E. van Valkenburg,** surface waves at ultrasonic frequencies, 390
Cook, L., *Paper*: "Basic Open-Hearth Practice at Volta Redonda," 1; biographical note, 76
Cook, P. M., *Paper*: "Dependence of Mechanical Properties of Forgings on Local Strain," 250; biographical note, 281
Cooke, N. E., continuous galvanizing, 297
Cope, S. R., drawing tapered shells, 191
Coppa-Zuccari, G., Italian iron and steel industry reorganization, 288
Cornet, P., working conditions in France, 207
Cottam, H. D., obituary notice, 281
Cottrell, A. H., microstructural interactions, 98
Cottrell, C. L. M., *Paper*: "Assessment of Weldability by Rapid Dilatation Tests." *Discussion*, 353. *Author's Reply*, 357; *Paper*: "Effect of Hydrogen on the Continuous-Cooling Transformation Diagram for a Manganese–Molybdenum Steel." *Discussion*, 353. *Author's Reply*, 357; weldability of B–Mo steel, 193
Coulter, R. S., elected Associate, 210
Cowling, K. W., A. Elliott, and **W. T. Hale,** bulk-density/thermal-conductivity relationship in insulating bricks, 287
Cox, F. G., and **G. L. Miller,** zirconium powder metallurgy, 384
Cox, J. E., and **A. S. Andrews,** enamels hair-lining, 94
Coxon, T., electrical developments at Consett, 174, 383
Crangle, J., magnetic determination of γ loops in iron alloys, 100
Crawford, H. B., elected Member, 210
Crepaz, E., ceramic coatings, 205
Crisp, J. D. C., gelatin as photoelastic-analysis material, 388
Crittenden, E. C., jun. *See* Hoffman, R. W.
Crockett, J. M. *See* Henderson, H. E.
Crosswhite, H. M. *See* Dieke, G. H.
Crussard, C., diffusion of nitrogen in iron, 350; pearlite-free basic Bessemer steels, 166
Curlook, W., and **L. M. Pidgeon,** Co–Fe–S system, 394
Curry, W. E. *See* Lena, A. J.
Cuthbertson, J. W., electrodeposition of tin alloys, 94

Dahl, W., and **K. Lücke,** carbon precipitation from stored iron, 99
Dahlstrom, D. A., waste pickle-liquor disposal system, 383; *see also* Emmett, R. C.
Daino, P., corrosion in petrol refinery, 205
Daniels, R. D. *See* Hoffman, R. W.
Danielsson, L. *See* Carlsson, C. G.
Danihelka, A., open-hearth remelting of stainless scrap, 184
Danko, J. C., and **J. F. Libsch,** secondary graphitization in tempered nodular iron, 392
Dardenne, explosion in hot-blast stove, 183
Dargent, R. *See* Fert, C.
Darnell, H., elected Member, 210
Das, B. N., elected Member, 210
Das, P. P., and **B. Chatterjee,** iron as catalyst in CO decomposition, 288
Das Gupta, S. C., and **D. S. Eppelsheimer,** end-quench hardenability test media, 292
Datta, P. B. *See* Rao, S. R. R.
Davenport, S. J., and **G. G. Morgis,** air-pollution bibliography, 207
Davidson, N., galvanizing and patenting frames, 296; wire-drawing machines, 191
Davies, B. G., and **T. Evans,** hydrogen solubility in Fe–C, 301
Davies, D. E., U. R. Evans, and **J. N. Agar,** oxidation of iron, 302
Davin, M., understressing in fatigue, 299
Davis, H. M. *See* Keeler, J. H.
Davis, J. D. *See* Brown, R. L.
Davis, W. R., and **G. R. Rigby,** CO dissociation by Fe compounds, 379
De, M. K. *See* Ghosh, P. K.
De Carli, F., and **P. Spinedi,** oxidation of heated metals, 205
De Cerna, P., corrosion protection by phosphatizing, 205
DeFiore, L., and **M. N. Hickock,** steelworks electrical equipment, 192
Deguchi, K., gas-turbine steels, 300; large carbide particles in ball-bearing-steel billets, 290; ring crushing test for ball-bearing steels, 197
Deisenroth, R. J., coating metal furniture, 297
de Laval, C. G., reverberatory melting furnaces, 88
Delbart, G., boron steels, 200
Delbart, G., and **A. Kohn,** boron-steel studies, 200
de Lehaie, P. H., continuous casting, 87
Delong, converter bottoms, 380
Demoulin, C., heat-treatment furnaces, 190
den Hartog, H. *See* de Sterke, A.
Denison, I. A., and **M. Romanoff,** soil corrosion of nickel cast irons, 206
De Paauw, D., impregnation of sprayed coatings, 95
Derge, G. *See* Goldman, K. M.
Deringer, W. A., tension tests of porcelain-enamelled sheet, 196
Desguin, R., and **R. Boulin,** determination of silicon in steels, 396
de Smet, G. *See* Gonin, J.
de Sterke, A., and **H. den Hartog,** sternpost non-destructive testing, 199
De Sy, A., graphite-nodules formation, 186; heat-treatment, 190; *see also* Foulon, J.; Van Eegham, J.
Deutsche Gesellschaft für Chemisches Apparatewesen E.V., *Book*: "Dechema-Werkstoff-Tabelle, Part 3," 102
Devernay, scrap baling press, 383
Dew, C. E., elected Member, 210
Dhanbhoora, D. R. *See* Schrader, H.
Dickmann, H., basic Bessemer process introduction history in Germany, 397
Dieke, G. H., and **H. M. Crosswhite,** flame emission and absorption, 84
Dieter, G. E., R. F. Mehl, and **G. T. Horne,** fatigue of lamellar-graphite and nodular irons, 391
Dietert, H. W., "D" casting process, 291
Diggin, M. B., nickel-plating bath, 195
Dijkstra, L. J., magnetic properties and microstructure, 98
Dillon, L. V., blast-furnace tuyeres, 183
Dimmock, R. H., obituary notice, 281
Diverse, J., plastic roll-neck bearings, 293
Dixon, D., slag attack on refractories, 182
Dixon, P. R., elected Associate, 210
Djingheuzian, L. E., temperature effects in ore grinding, 83
Doat, M. E., grey-iron castings, 186
Dobrý, J., brick thermal-shock testing, 287
Dohna, A. E. *See* Risch, T. A.
Dolan, T. J. *See* Work, C. E.
Doldon, R., elected Associate, 210
Domenicali, B., corrosion inhibitors in boiler descaling, 205; corrosion inhibitors in castings cleaning, 205
Donaldson, V. V. *See* Anderson, C. T.
Donati, E., and **G. Beretta,** corrosion in heating pipes, 205
D'Orazio, A. J., plating-waste treatment, 296
Doré, R. E., oxygen in engineering, 295
Dorn, J. E., and **C. D. Starr,** phase-dispersions effects, 98
Douglas, L., elected Member, 210
Downie, C. C., furnace instrumentation, 183
Dravnieks, A., and **H. A. Cataldi,** corrosion-evaluation method, 395
Drolet, J. P., mineral resources of Quebec, 284
Drubba, H. *See* Rudorff, D. W.
Druzhinin, F. G. *See* Granovskiĭ, I. V.
Dubinkina, R. P. *See* Belevtsev, Ya. N.
Duckworth, W. E., sintered Cu–Pb bearing material, 386; *see also* Forrester, P. G.
Duffield, A., and **P. Grootenhuis,** pressing air-atomized copper powder, 385
Duflot, M. J., ingot moulds, 185
Dufraine, coke-movement study at tuyeres, 184
Dugdale, D. S., hardness-test cones, 198

Dunmore, O. J., and **G. C. Smith,** fatigue of sintered Cu compacts, 386
Dunn, C. G., recrystallization of rolled silicon iron, 204; recrystallization textures, 203
Dupuy, E., grain-size measurement, 202
Durand, C. *See* Scortecci, A.
Durand, J., ingot moulds, 185
Duré, P. R., cracked-ammonia atmospheres, 190; gaseous chromizing, 296
Durelli, A. J., and **S. Okubo,** crack-density studies in Stresscoat, 95
Durrell, W. H., Quebec-Labrador iron-ore deposits, 83
Durrer, R., *Book*: "Verhütten von Eisenerzen," 103; electric-furnace smelting, 379; iron and steel production data, 397
Dusinberre, G. M., transient-temperature calculation in pipes and heat exchangers, 84
Dutli, J. W., and **G. M. Taylor,** cesium radiography, 389
Dutli, J. W., and **G. H. Tenney,** radiographic visualization of cracks, 389
Duwez, P. *See* Jepson, J. O.
Dyne, P. J., emission spectra of polyatomic radicals, 84

Earp, F. K. *See* White, A. E. S.
East, T. F. *See* Kenworthy, L.
Ebel, W. E., enamel finishes, 94
Echterhoff, H., coal-softening tester, 85
Edel, H., nodular-iron weldability, 193
Eden, T. F. *See* Frederick, S. H.
Edman, I., MTM in foundry, 89
Edmonds, C. *See* Atterton, D. V.
Edström, J. O., and **S. E. Erikson,** temperature effect in decarburization, 298
Edwards, A. B., *Book*: "Textures of the Ore Minerals and Their Significance," 303
Edwards, R. *See* Brownlee, L. D.
Eeghem, J. Van. *See* Van Eeghem, J.
Ehrensperger, G., and **F. Fournier,** Gerlafingen steelworks, 380
Ehringer, H., Pt–Rh thermocouples, 379
Eickhoff, A. J., testing paint films, 196
Eisenreich, H. *See* Baake, R.
Eisler, S. L. *See* Sass, R. L.
Ekbom, L., micropolishing machine, 202
Ekwall, G. *See* Alfort, S.
Elcock, E. W., obituary notice, 281
Eldred, D., electronic testers, 389
Eliassen, R. *See* Lamb, J. C.
Elliot, G. D., Seraphim project at Appleby-Frodingham, 287
Elliott, A. *See* Cowling, K. W.
Ellis, A. W., biographical note, *frontispiece*
El-Mehairy, A. E., *Paper*: "Reducibility of Iron-Ore Lumps," 219; biographical note, 281
Emerick, H. B., oxygen applications in iron and steel making, 289
Emmett, R. C., and **D. A. Dahlstrom,** gravitational classifiers, 285
Endo, K. *See* Nishihara, T.
Engelbrecht, A. *See* Wilson, R. H., jun.
Enghag, P., spectrophotometric determination of silicon, 302
Engineer, *Book*: "The Engineer Buyers' Guide," 398
Enrico, F., metal finishing in Italy, 296
Enroth, E. A. R., elected Member, 210
Eppelsheimer, D. S. *See* Das Gupta, S. C.
Epremian, E., and **R. F. Mehl,** statistical behaviour of fatigue properties, 197; statistical interpretation of understressing effect in fatigue, 197
Erikson, S. E. *See* Edström, J. O.
Ernest, W., *Paper*: "Waste-Heat Recovery Related to the Generation of Electric Power," 271
Ernst, H., and **K. Kleinschmidt,** forging cranes, 193
Eschbacher, E. W. *See* Pellini, W. S.
Ess, T. J., Fairless works, 184
Estwal, J., hot-blast cupola, 186
Eudier, M., activated sintering, 385
Eugène, F., internal energy in cold-worked metals, 197
Euler, H. *See* Stevens, H.
Evans, A. A., grey-iron fluidity test, 89
Evans, E. R., defects in vitreous-enamelled castings, 298
Evans, E. R., and **D. McK. Webster,** cracking in bath castings, 188
Evans, P. E., and **G. C. Smith,** rolling copper powders, 386
Evans, T. *See* Davies, B. G.
Evans, U. R., corrosion at coating gaps, 302; corrosion and welding, 395; *see also* Davies, D. E.
Everhart, J. L., Cr–Mn steels, 97; infiltration of powder parts, 95
Ezz, S. Y., elected Member, 210

Fabrykowski, Z. J., S. Goodman, and **B. A. Schevo,** Army weld-cracking test, 193
Fackert, W., pickling lines, 194
Fahlenbrach, H., and **E. Houdremont,** permeability increasing by oxidizing anneal, 300
Faragher, P. V., inspection test data, 95
Farquhar, J. C., combustion control, 378
Farrington, G. E., mills at Fairless, 192
Fast, J. D., and **M. B. Verrijp,** *Paper*: "Difference of Nitrogen in Iron." *Discussion*, 350. *Authors' Reply*, 351
Faure, J., steel recuperators, 285
Faust, W. R. *See* Beach, L. A.
Fay, C., austempering thin parts, 381
Feasey, J., spray packaging, 384
Fedora, P. *See* Wallace, J. R.
Feely, F. J., D. Hrtko, S. R. Kleppe, and **M. S. Northup,** brittle fracture, 197
Feild, A. L., precipitation hardening of stainless steels, 200
Feldborg, J. I., precision stampings, 38
Felix, W. A., ultrasonic testing, 199
Feltham, P. *See* Cole, D. G.
Fernbach, H. R., elected Member, 210
Ferney, L. A., maintenance, 207
Ferrara, E., coke sizing, 182
Ferrat, F., spray-cooled cupola, 186
Ferri, A., passivity of stainless steels, 205; *see also* Masi, O.
Ferry, M., ingot-mould structure, 185
Fert, C., and **R. Dargent,** silica-replicas method, 392
Fessler, H., photoelastic-analysis materials, 388
Fiedler, H. C., B. L. Averbach, and **M. Cohen,** effect of deformation on martensitic transformation, 393
Field, J. E., fatigue strength of screw threads, 299
Fielden, C. F. R. *See* Messenger, J. H.
Fielden, C. F. R., and **J. H. Messenger,** steelworks auxiliary-motors standardization, 294
Finch, D. C., elected Member, 210
Finnern, B., dimensional changes in case hardening, 191
Fiore, L. De. *See* DeFiore, L.
Fisher, C. E., and **D. F. Zlatnik,** zinc-plated cartridge cases, 195
Fisher, R. E. S., biographical note, *facing* 104
Fitch, E. P., and **E. C. Johnson,** cyclones behaviour, 285
Fitzer, E., electrochemical spot testing of ferrous metals, 303; *see also* Hohn, H.
Fitzgeorge, D. *See* Attia, Y. G.
Floe, C. F. *See* Bever, M. B.
Fontana, M. G. *See* Mitra, M. S.
Förland, T., fused-slag ion-exchange equilibria, 289
Fornander, S., iron and ingot-steel production in Sweden, 86; iron-ore pelletizing in Sweden, 268
Forrest, P. G., and **H. G. Tapsell,** alternating fatigue tests, 390
Forrester, P. G., and **W. E. Duckworth,** sintered Cu–Pb bearing materials, 387
Forslund, S., castings pouring-rate determination, 381
Förster, F., crack testing with slip-over coils, 389; electronic sorting, 199; magnetic sorters, 300; magneto-inductive crack testing, 389; non-destructive testing with slip-over coils, 389
Förster, F., and **H. Breitfeld,** eddy-current testing, 389
Förster, F., and **K. Stambke,** eddy-current testing, 389
Förster, F., and **G. Zizelmann,** sheet anisotropy determination by coercive-force tester, 300
Forward, F. A., nickel powder, 196
Foschini, L. *See* Collari, N.
Foulon, J., and **A. De Sy,** effect of copper in cast iron, 201
Fournier, F. *See* Ehrensperger, G.
Frame, W. M., elected Member, 210
Francisco, A. C., and **G. M. Ault,** coatings for jet-engine parts, 196
François, J., and **R. Bedier,** coking-coals pressure, 286
Franke, W., coal storage for spontaneous-ignition prevention, 285
Franklin, N. L. *See* Cass, F. H.
Franks, R., W. O. Binder, and **J. Thompson,** nitrogen-containing Cr–Mn steels, 393
Franssen, H., sintered-powder rolling, 384
Frantsevich, I. N. *See* Frantsevich-Zabludovskaya, T. F.
Frantsevich-Zabludovskaya, T. F., I. N. Frantsevich, and **K. T. Modylevskaya,** electrolytic preparation of Fe–Mo–Ni alloys, 394
Franz, F., open-hearth repair-time reduction, 289
Frasch, J., corrosion inhibition and activation, 301
Frazier, R. H. *See* Boulger, F. W.
Frede, L., and **W. Magers,** casting and gating, 188
Frederick, S. H., and **T. F. Eden,** corrosion by V_2O_5 in gas turbines, 394
Fredericks, S. L., open-hearth cold-metal practice, 289
Freudenthal, A. M., and **R. A. Heller,** effect of thermal activation on butt-weld fatigue life, 295
Freygang, J., ore-sampling equipment, 181
Freyn, F., and **W. Hotop,** boron additions in vacuum sintering, 386
Friedman, H., L. S. Birks, and **E. J Brooks,** X-ray fluorescent spectrographic analysis, 102
Frith, P. H., fatigue tests on rolled alloy steels, 388
Fry, D. L., and **T. P. Schreiber,** spectrographic line-pairs selection, 396
Fujita, T. *See* Akutagawa, T.
Fukase, T. *See* Sawamura, H.
Fuller, J. H. *See* Clark, R. W.
Fuller, W. E., elected Member, 210
Fullman, R. L. *See* Seybolt, A. V.
Fulton, J. C. *See* Chipman, J.
Furukawa, K. *See* Takaki, H.

Gabler, F., surface interferometer, 388
Gale, W. K. V., ironmaking in Black Country, 303
Ganguly, R. *See* Chatterjee, G. P.
Gantzckow, H., spectrochemical arc, 396
Gardiner, J. H., elected Member, 210
Gardner, D. G., E. J. Serfass, and **R. F. Muraca,** determination of Cu, Fe, and Ni in effluents, 397
Garrett, C., A. Morrison, and **G. Rice,** iridium fluoroscopy and radiography, 198
Gascuel, L., shock fatigue, 92
Gaskell, J. L., electrical power supply at Appleby-Frodingham, 287
Gaskey, G. R., jun. *See* Chipman, J.
Gaunt, R. L., electric furnaces for mild steel, 87
Gautier, H. *See* Loison, R.
Gaydon, A. G., electronic excitation of flame spectra, 84
Gaydon, A. G., and **H. G. Wolfhard,** flame spectra, 84
Geary, A. *See* Uhlig, H. H.
Geiger, E. E., oil-fired cupola, 291
Geiszler, A. R. *See* McArthur, D. A.
Gelain, J., statistical study of cast-iron analyses, 206

Gel'd, P. V. *See* Serbrennikov, N. N.
Geleji, A., power requirements for rolling sections, 292
Gemmill, M. G., biographical note, 281; *see also* Bardgett, W. E.
Gensamer, M., grain-boundary effects, 98
Genta, V. *See* Riccoboni, L.
George, B., tool steel, 185
Gerin, mechanization effects in iron-ore mines, 377
Gerosa, E., cathodic protection, 205
Gertsman, S. L. *See* Shnay, R. C.
Ghosh, J. C., and **T. C. Bagchi,** Indian manganese-ore reserves, 284
Ghosh, P. K., M. K. De, and **R. B. Ghosh,** manganese-ore beneficiation, 285
Ghosh, R. B. *See* Ghosh, P. K.
Giannone, A., refractory-wall stability criterion, 379
Gibson, J., metals behaviour under short-term tensile loads, 387
Gilbert, G. N. J., ductility of whiteheart malleable, 201; impact properties of cast iron, 391; temper embrittlement in blackheart-malleable and nodular irons, 202; toughness of cast irons, 201
Gilbert, M. *See* Penner, S. S.
Gill, E. T., weldability, 356
Gillam, E. *See* Cole, D. G.
Gillyat, B. T. *See* Riley, R. V.
Ginzburg, E. S. *See* Kreshchanovskii, N. S.
Gittus, J. H., mould factors in casting defects, 188; sand grain-size-distribution effects, 381; surface finish of iron castings, 381
Givaudon, J., basic converter heat balance, 288; ironmaking thermodynamics, 288
Gleber, J. A. *See* Clark, R. W.
Glen, J., *Paper*: "Some Additional Creep and Rupture Data on Molybdenum, Chromium–Molybdenum, and Molybdenum–Vanadium Steels," 320
Gobus, A., and **N. A. Kahn,** weld radiography, 198
Goergen, F.-A., scrap supplies, 397
Goertz, Matilda. *See* Williams, H. J.
Gokcen, N. *See* Chipman, J.
Goldbeck, O. von. *See* von Goldbeck, O.
Goldman, K. M., G. Derge, and **W. O. Philbrook,** effects of elements on sulphur transfer across slag/metal interface, 184
Goltz, A., W. Jacobs, and **O. Burghardt,** iron-ore flotation, 181
Gómez, F. R., ultrasonic testing of welds, 390
Gomez, M. *See* Goodman, J. B.
Gonin, J., and **G. de Smet,** steels classification by hardenability tests, 300
Gooding, R. G., and **R. Rew,** sand-mixtures behaviour under load, 187
Goodman, I. S., high-speed cinematography of welding, 294
Goodman, J. B., M. Gomez, V. F. Parry, and **W. S. Landers,** coking-coal assayer, 286
Goodman, S. *See* Fabrykowski, Z. J.
Gordet, A., galvanizing kitchen utensils, 296; galvanizing threaded parts, 297
Goto, S. *See* Ihida, M.
Gouzou, J., continuous-casting developments, 290; continuous-casting review, 87
Graham, A., biographical note, 175
Graham, A., and **K. F. A. Walles,** *Paper*: "Relationships between Long- and Short-Time Creep and Tensile Properties of a Commercial Alloy," 105
Graham, A. K., cleaning cycles, 295
Graham, R. W., crane power limit switches, 193
Graifer, E. Z., and **I. V. Salli,** graphite surface formation in vacuum heat-treatment, 390
Grandi, A., electrolysis at Società Metanodotti, 205
Grandvoinnet, J., strength-testing methods, 298
Granovskiĭ, I. V., and **F. G. Druzhinin,** determination of CaO in slags by fluoride method, 397
Grant, N. J. *See* Roberts, E. C.
Granval, J. H., coals plasticity, 286
Graus, G., permeability of iron oxides, 100
Gray, A. G., Carilloy steel, 201
Grebinar, H. L., zinc-rich paint, 94
Greco, E. C., and **J. C. Spalding, jun.,** corrosion-inhibitors evaluation, 101
Green, E. C., D. J. Jones, and **W. R. Pitkin,** high-density tungsten-based sintered alloys, 387
Green, H. J. Y., heating and ventilation of steelworks, 398
Green, H. T., and **R. M. Brick,** effect of Al on ferrite, 200
Green, J. H. *See* Lynn, A. L.
Green, R. B., thermodynamics, 397
Greenblatt, J. H., sea-water trials of vinyl finishes, 101
Greenfield, P., and **P. A. Beck,** sigma phase in binary alloys, 203
Greenhouse, H. M., R. F. Stoops, and **T. S. Shevlin,** carbide-base cermet, 300
Greensite, A. *See* Albers, H.
Greenwood, H. W., powder metallurgy in relation to ore supplies, 95
Grenier, G., open-hearth and Bessemer processes, 289
Griese, F. W., maintenance welding, 295
Grilliat, J. *See* Ballay, M.
Grimm, W. *See* Möller, H.
Groff, J., lubricants evaluation, 294
Grootenhuis, P. *See* Duffield, A.
Gross, W. A., and **W. W. Soroka,** elasticity co-ordinates, 96
Grosse, A. V. *See* Wilson, R. H., jun.
Grosstück, P., slag granulation, 183
Grotheer, M. *See* Slabaugh, W. H.
Grotke, G. *See* Nippes, E. F.
Grott, G. J. *See* Zang, V. E.
Grounds, A., coal preparation, 378
Grove, M. B., internal coating of pipes, 194
Grover, H. J. *See* Case, S. L.
Gründer, W., wet process for coal-ash reduction, 285
Guard, R. W., J. H. Keeler, and **S. F. Reiter,** high-temperature tensile deformation, 199
Guihaumé, R., deformation and secondary recrystallization, 392
Guillamon, J., Brinell-hardness correlations with grey-iron P content and mechanical properties, 200
Guingand, J., heat-treatment in high-nitrogen gases, 189
Gulbransen, E. A., W. R. McMillan, and **K. F. Andrew,** oxidation of iron at low pressures, 302
Gulyaev, A. P., A. G. Zavrazhin, and **I. A. Strel'nikov,** electron microscopy of iron and steel, 202
Gupta, S. C. Das. *See* Das Gupta, S. C.
Gurevich, A. M., photoelectric optical pyrometer, 286
Gurnham, C. F., hot-dip tinning, 297
Gurovich, E. I., corrosion by molten alkali chlorides, 394
Guthmann, K., and **E. Hofmann,** flame-radiation research at Ijmuiden, 378
Gutovskaya, Z. P., CO_2 and moisture determination in case-hardening agents, 191
Gutzeit, G., Kanigen plating process, 296

Haarmann, R., tubes pretreatment for hot-dip galvanizing, 297
Habraken, L., TTT curves, 190
Hackerman, N., and **A. C. Makrides,** polar organic corrosion-inhibitors action, 101
Hackett, F. J., elected Member, 210
Hafemeister, R. N., ultrasonic testing of forging ingots, 198
Hagel, W. C., elected Member, 210
Hague, H. G. *See* Smith, D. M.
Hale, W. T. *See* Cowling, K. W.
Hall, E. O., hardness variation with grain-size, 198
Hall, W. L., after-treatment of galvanized steel, 297
Halls, E. E., barrel-plating electrolytes, 296; conveyors in plating and enamelling, 296
Halm, L., ladle refractories, 182; steel-casting refractories, 379
Halmshaw, R., iridium radiography, 199
Hamilton, D. C. *See* McIntosh, G. E.
Hammond, R. A. F. *See* Williams, C.
Hampel, C. A., *Book*: "Rare Metals Handbook," 207
Hancock, P. F., annealing-furnaces conversion to natural-gas firing, 187
Hancock, R. A., biographical note, 374; *see also* Turkdogan, E. T.
Hand, T., and **H. W. Baque,** Corhart refractories, 287
Hanne, basic electric-furnace lining mix, 185
Hanocq, C., lubrication, 294
Hanson, H. P., and **H. W. Schrader,** X-ray spectrometer, 302
Hanysz, E. A. *See* Weller, E. F.
Harbour, D. W., spray packaging, 296
Hard, A. R., Arcair cutting process, 295
Harding, T. T. *See* Wallwork, S. C.
Harper, J. D., elected Associate, 210
Harr, R., water supply at Höntrop works, 102
Harris, G. T., and **H. C. Child,** *Paper*: "Uranium in Heat-Resisting Alloys," 347; Co–Ni–Fe–Cr powder alloys, 387; rupture strength of metal-bonded refractory oxides, 387
Harris, G. T., H. C. Child, and **J. F. Howard,** creep of TiC-based materials, 387
Harris, G. T., H. C. Child, and **J. A. Kerr,** *Paper*: "Effect of the Composition of Gas-Turbine Alloys on Resistance to Scaling and to Vanadium Pentoxide Attack," 241
Harris, W. R., and **L. F. Stringer,** temper-mill tension regulator, 382
Harrison, L., and **S. Marton,** high-strength powder parts, 386
Harrison, W. N., porcelain-enamel and ceramic-coatings selection, 196
Harry, E. D., *Paper*: "Sub-Critical Decomposition of Carbide Phase in Some Low-Carbon Silicon Steels." *Correspondence*, 249. *Author's Reply*, 249
Harry, R. J., crane limit stop, 193
Hart, E. W., dispersion hardening, 98; slip process in yielding, 299
Hartog, H. den. *See* den Hartog, H.
Harvey, C. C., protective painting, 195
Harvey, R. F., salt-bath quenching-power test, 382
Haseba, S., and **M. Nakahara,** pressurized coke ovens, 286
Hashiguchi, S. *See* Takase, T.
Hasler, M. F., and **J. W. Kemp,** multi-channel recording in X-ray fluorescent analysis, 102
Hauffe, K., oxidation and corrosion mechanisms, 100
Hauk, V., stress determination by lattice-constant measurements, 99
Hausner, H. H., grain growth in sintering, 385
Hausseghy, L., and **H. Martinod,** stress-determination method, 299
Hauttmann, H. F., LD steels, 97
Havelka, M., waste-heat utilization in iron and steel making, 285
Hawkes, H. E., H. Wedow, and **J. R. Balsley,** Boyertown magnetite deposits, 377
Hawkes, M. F. *See* Busby, C. C., *also* Lena, A. J.
Hayashi, J. *See* Takaki, H.
Haynes, H., moulding methods, 188
Haynes, R., and **D. Thomas,** Pitot gas-flow determination, 397
Hays, E. M., iron-ore handling at U.S. ports, 377
Hayton, W. P., elected Member, 210
Hazlett, T. H. *See* Parker, E. R.
Heczko, pumice slag, 183; slag wool, 183
Hedgecock, P. D., elected Associate, 210
Hedvall, J. A., reactivity of solids, 385
Heimkamp, R. F., flame-cutting control, 295
Heine, R. W. *See* Beach, A. B., *also* Kempka, G. E.
Heller, R. A. *See* Freudenthal, A. M.

Henderson, A., rolling at Consett, 174, 382
Henderson, H. E., and **J. M. Crockett**, calcium carbide injection in cupola iron, 88
Henderson, L., elected Associate, 210
Hendus, H., and **H. Röhrig**, Chevenard microtensile-tester diagrams, 387
Henke, R. H., and **R. A. Lula**, rare-earth additions to hot-rolled stainless steel, 200
Henry, J., cooling-rate effects on grey iron, 90
Hepburn, W. M., annealing furnace, 291
Herbek, E. W., jun., and **R. F. Strohecker**, lubricants in fretting-corrosion inhibition, 101
Herbert, D. B., elected Member, 210
Herkenhoff, E. C., ore-beneficiation plant, 84
Herman, R. C. *See* Hornbeck, G. A.
Herne, H., bichromatic pyrometers, 182
Herrmann, C. *See* Hofmeister, H.
Hessenberg, W. C. F., and **W. N. Jenkins**, screw and speed-setting changes effects in tandem mills, 292
Hessinger, P. S. *See* Weber, B. C.
Hibi, T., and **K. Yada**, high-resolution replicas, 392
Hickethier, C. F., biological corrosion, 394
Hickley, R. H., and **A. G. Quarrell**, *Paper*: "The Graphitization of Steel at Subcritical Temperatures." *Correspondence*, 319. *Authors' Reply*, 319
Hickock, M. N. *See* DeFiore, L.
Higgins, R. I., phosphorus reduction in cast iron, 380
Higgins, W. F., electrolytic corrosion of iron and copper, 101
Hillman, M. H., magnetic and electrical properties of cast iron, 202
Hinkel, J., iron-powder coated welding electrodes, 295
Hinnüber, J., and **O. Rüdiger**, CrC in hard-metal alloys, 387; machining methods, 194
Hirone, T., **S. Maeda**, and **N. Tsuya**, recording magnetic balance, 96
Hisamatsu, Y., and **M. Kanno**, organic corrosion inhibitors, 93
Hiscock, S. A., dross formation in hot-dip galvanizing, 297
Hitt, W. C., ultrasonic testing, 199
Hochmann, J., intergranular phenomena, 392
Hoffman, R. W., **R. D. Daniels**, and **E. C. Crittenden, jun.**, stress in vapour-phase films, 296
Hoffmann, E., coal-fines preparation in cyclones, 285
Hoffmann, L., straightening extruded shapes, 191
Hofmann, E. *See* Guthmann, K.
Hofmeister, H., and **C. Herrmann**, oxygen lancing in converter, 184
Hohn, H., and **E. Fitzer**, containers for nitric acid based explosives, 395
Hoke, J. H. *See* Lindsay, R. W.
Holetzko, H. *See* Jellinghaus, W.
Holgate, S. M., spray welding, 298
Holley, J. L., and **D. P. Patterson**, forging jet-engine parts, 91
Hollomon, J. H., structure-sensitive properties, 98
Holman, G. P., forging, 292
Holmberg, T. F., award of Hadfield Medal, 372
Hood, H. C., heavy press, 91
Hoover, E. L., torsion testing of porcelain enamels, 196
Hopkins, A. D., and **K. Sachs**, graphitization in low-carbon silicon steels, 249
Hopkins, B. E., diffusion of nitrogen in iron, 350; *see also* Rees, W. P.
Hopkins, B. E., and **H. R. Tipler**, *Paper*: "Effect of Heat-Treatment on the Brittleness of High-Purity Iron–Nitrogen Alloys." *Discussion*, 163. *Authors' Reply*, 168
Hopkins, D. W., *Book*: "Physical Chemistry and Metal Extraction," 398
Horger, O. J., fretting corrosion, 101
Horger, O. J., and **H. R. Neifert**, large-specimen fatigue properties, 197
Hornbeck, G. A., and **R. C. Herman**, polyatomic flame bands, 84
Horne, G. T. *See* Dieter, G. E.
Horsley, H., oiling of coal, 85
Horstmann, D., attack of Zn on Fe, 101; effect of Sb on attack by Fe-saturated Zn melts, 101; *see also* Wiester, H.-J.
Hosdowich, J. M., electroplating, 195
Hotop, W. *See* Freyn, F.
Hotta, H., high-speed steels, 295
Hotta, H., and **I. Tatsukawa**, tool-steel study, 202
Hotta, Y. *See* Sawamura, H.
Hotz, P. E. New Jersey magnetite deposits, 377
Houdek, F., and **M. Oppelt**, oxygen lancing of pig iron for vanadium recovery, 183
Houdremont, E. *See* Fahlenbrach, H., *also* Jellinghaus, W.; Krisement, O.
Howard, J. C., economic comparison of open-hearth and electric steelmaking, 185
Howard. J. F. *See* Harris, G. T.
Hrtko, D. *See* Feely, F. J.
Hüber, H., ingot dressing machines, 383
Huddleston, W., elected Member, 210
Hudson, J. C., protective coatings for ships and marine installations, 101
Hugony, E., corrosion problems, 205
Hukki, R. T., mechanical ball wear, 377
Hull, D., martensite transformation, 204
Hulme, C., blast-furnace coke, 85
Hultgren, A., **Y. Lindblom**, and **E. Rudberg**, eutectic solidification in hypo-eutectic irons, 291
Hundy, B. B., *Paper*: "Determination of Residual Stresses in Lightly Rolled Thin Strip," 23; *see also* Murray, G.
Huseby, R. A., and **T. McL. Jaspers**, weld-stress measurement by trepanning, 93
Huss, E. H., corrosion in pumps, 395
Hutchinson, T. F., power station at Consett, 174, 383
Hüttemann, P., and **R. Mintrop**, blast-furnace-slag utilization in U.S.A., 86
Hüttig, G. F. *See* Torkar, K.
Hüttig, G. F., and **H. Sales**, grinding metal powders, 384
Hyde, G. F., salt-bath heat-treatment of gun mechanism, 190

Ida, S. *See* Jo, H.
Ihida, M., **A. Kawano**, **S. Tsuchida**, and **S. Goto**, determination of Al, Al_2O_3 and AlN in steel, 396
Imai, Y. *See* Tanaka, T.
Indelli, A., passivation by oxidizing agents, 205; *see also* Cavallaro, L.
Indelli, A., and **G. P. Bolegnesi**, cleaning-inhibitors action and adsorption, 205
Ingham, H. S., metallizing, 196
Inouye, K., and **M. Kato**, piercing seamless tubes, 293
Inouye, K., and **T. Soyejima**, cracks in tube-blank piercing, 293
In'shakov, N. N., **A. I. Sitnichenko**, and **A. I. Rozhnov**, steel deoxidation with Mg alloy, 380
Institute of British Foundrymen, cupola developments, 186
Institute of Metals, powder-metallurgy symposium, 384
Institute of Physics, *Book*: "Laboratory and Workshop Notes, 1950–1952," 303
International Research Committee on the Low Shaft Furnace, *Paper*: "Results of One Year of Operation, 1953–54," 36
Ipatov, N. K., sulphur removal in small acid converter, 380
Ipsen, H., and **E. J. Rupert**, carbon controller, 189
Irmann, R., sintered Al powder, 387
Iron and Steel Institute, list of periodicals abstracted, 79; powder-metallurgy symposium, 384; Report of Council for 1954, 305; rolling bibliography, 280
Isa, S. *See* Tagaya, M.
Isenberg, R. H., wiremaking practice, 191
Ishizuka, H., effects of chromium on non-metallic inclusions, 290
Ito, Y. *See* Okada, M.
Itzel, M., grey-iron standards, 97; *see also* Lissell, E. O.
Ivanov, D. P., lamellar graphite, 204
Iwanciw, E., metal oxides reduction by carbon, 183

Jackson, A., Seraphim project at Appleby-Frodingham, 287
Jackson, R. *See* Barber, R.
Jackson, W., award of Williams Prize, 373
Jacobs, F. W., and **E. C. Ashley**, air-furnace bottom-temperature relationships, 88
Jacobs, W. *See* Goltz, A.
Jacopetti, M., soil-corrosion protection, 205
Jacquet, P. A., surface flaws from working, 93
Jamison, R. S., cold-treatment, 292
Janecký, K., heating galvanizing kettles, 296
Jansen, H., elected Member, 210
Jarema, A. J., batch quenching, 292
Jaspers, T. McL. *See* Huseby, R. A.
Jeffrey, R. S. M., and **J. A. Richards**, die-pressing of gutters, 291
Jellinghaus, W., ultrasonic testing, 388
Jellinghaus, W., and **E. Houdremont**, austenite transformation, 99
Jellinghaus, W., **A. Rose**, and **H. Holetzko**, austenite decomposition in manganese steels, 99
Jeníček, L., oxygen in metal industry, 207
Jenkins, I. *See* Robins, D. A.
Jenkins, W. N. *See* Hessenberg, W. C. F.
Jepson, J. O., and **P. Duwez**, Fe–Ce system, 393
Jeromson, J. R., jun. *See* Wright, D. K.
Jessop, C. T. J. *See* Sugarman, B.
Jo, H., **S. Ida**, and **K. Mitsuyama**, coal-caking test, 378
Johns, I. B. *See* Nielsen, M. L.
Johnson, E. C. *See* Fitch, E. P.
Johnson, O., rods and balls charging in mills, 377
Johnson, P. A., and **A. L. Babb**, irreversible corrosion-processes thermodynamics 101
Johnson, W. C., and **J. T. Yardley**, reagents for metals, 395
Johnson, W. H., **H. F. Bishop**, and **W. S. Pellini**, flow in gating, 188
Jolly, R., manganese sulphide inclusion segregation in grey iron, 188
Jominy, W. E. *See* Chapman, R. D., *also* Ross, S. T.
Jones, B., premixing moulding-sand additions, 187
Jones, D. De G., elected Associate, 210
Jones, D. J. *See* Green, E. C., *also* Thomas, V.
Jones, H. E., elected Member, 210
Jones, W. D., metal powders in engineering, 384
Jory, E. J., cooling cracks in white iron, 188
Josefsson, Å., *Paper*: "Pearlite-Free Basic Bessemer Steel: Its Fabrication and Properties." *Discussion*, 163. *Author's Reply*, 170; impact transition temperatures of heat-treated pearlite-free mild steels, 97
Josefsson, Å., and **G. Lagerberg**, brittleness in high-purity Fe–N alloys, 167
Joumat, P., spot-weld testing method, 295
Joumot, F. E., jun., and **L. Muldawer**, iron carbonyl powders, 298
Jowle, W. S., elected Member, 210
Joyce, D., sintering, and sinter effects in blast-furnace, 83
Justin, J. P., electrotinning, 94
Juvan, H., testing by radio-isotopes, 388; ultrasonic equipment, 388

Kabirov, A. V. *See* Kochergin, V. P.
Kahn, N. A. *See* Gobus, A.
Kaiser, E. R., heat extraction from coal combustion gases 84

Kangro, W., and **G. Wiebke,** determination of iron and iron oxides, 303
Kanno, M. *See* Hisamatsu, Y.
Kanova, L. A. *See* Koval'skii, A. E.
Kapur, R. N., Indian iron and steel industry, 207
Karlovitz, B., flame-generated turbulence and combustion-gas heat transfer, 84
Kasper, J. S., chi phase in Fe–Cr–Mo system, 301
Kato, M. *See* Inouye, K.
Katz, W., electrolytic dissolution study of zinc coatings, 296
Katz, W., and **T. Kempf,** corrosion by fluorides, 100
Kaufmann, M., three-phase furnaces, 290
Kawai, M., hydrogen in steel, 396
Kawai, T., and **M. Nishada,** testing-temperature effects on notched impact toughness, 197
Kawai, Y. *See* Saito, T.
Kawano, A. *See* Ihida, M.
Kearney, T. J., ultrasonic cleaning, 93
Keeler, J. H. *See* Guard, R. W.
Keeler, J. H., G. P. K. Chu, and **H. M. Davis,** reboiling in vitreous enamels, 95
Kehl, G. L. *See* Bhattacharyya, S.
Kelly, A., X-ray microbeam study of tension-deformed iron, 393
Kemp, I. M., Seraphim project at Appleby-Frodingham, 287
Kemp, J. W. *See* Hasler, M. F.
Kempe, *Book*: "Kempe's Engineer's Year Book for 1955," 399
Kempf, T. *See* Katz, W.
Kempka, G. E., and **R. W. Heine,** furnace-atmosphere effects on malleable iron, 88
Kennedy, A. J., creep strains, 97
Kenworthy, L., corrosion of ships machinery, 100
Kenworthy, L., and **T. F. East,** electrolytic derusting, 295
Kerr, J. A., biographical note, 281; *see also* Harris, G. T.
Kessler, H. *See* Schneider, K.
Kesterton, A. J., *Paper:* "Some Starting and Operating Experiences at Abbey Melting Shop," 46
Ketcham, Sara J., testing ceramic coatings, 196
Ketterer, E. F. *See* Wilder, A. B.
Kieffer, R., and **F. Benesovsky,** transition-metal silicides, 387
Kienzle, O., die-forging precision, 292
Kiesel, K.-L. *See* Küntscher, W.
Kiessler, H., and **E. Kunze,** hardness of case-hardened discs, 96
Kikuchi, Y. *See* Maekawa, S.
Killingsworth, R. B., C. W. Nicols, jun., and **J. F. Socolofsky,** lubricants research and testing, 294
Kimball, R. W. *See* Anderson, C. T.
Kimura, K. *See* Abe, F.
Kinelski, E. H., H. A. Morissey, and **R. E. Powers,** sinter-tests evaluation, 83
Kingcome, J. C., protective ships paints, 394
Kingston, R., iron-ore evaluation, 86
Kingswood, V. S., carbon applications, 286
Kinnunen, J., and **B. Merikanto,** determination of C and CO_2, 396
Kinnunen, J., B. Merikanto, and **B. Wennerstrand,** determination of Co, 396
Kiriyama, S., and **T. Kishi,** determination of oxygen in steel, 396
Kirkov, P. *See* Markovic, T.
Kirtchik, H., stress determination in stainless steel, 389
Kishi, T. *See* Kiriyama, S.
Kitani, T. *See* Okada, M.
Kleinschmidt, K. *See* Ernst, H.
Klemens, P. G., lattice component of thermal conductivity, 96
Klemm, H., etching process for P in cast iron, 392
Klepp, F., and **R. Rinesch,** converter LD process, 87
Kleppe, S. R. *See* Feely, F. J.
Klimec, J., and **S. Podgornick,** heating-furnace heat indices, 90
Klinck, R. W., elected Member, 210
Kling, F. E., blast-furnace design, 287
Klinger, L. J. *See* Troiano, A. R.
Knaepper, J., wire drawing, 382
Knall, D. R., blast-furnace at Westfalenhütte, 86
Knapp, B. B. *See* Wesley, W. A.
Knight, F. J., cyanide-wastes disposal, 194
Knüppel, H. *See* Mayer, K. E.
Knüppel, H., and **Mayer, K. E.,** basic Bessemer rimming-steels defects susceptibility, 380
Knuth-Winterfeldt, E., electrolytic polishing, 202
Koch, A. J. J., magnets shell moulding, 89
Koch, P., metals solution-pressure changes under low stresses, 301
Koch, W. *See* Wever, F.
Kochendörfer, A., brittle fracture, 299
Kochergin, V. P., removal of Sn–Pb from tinned iron, 94
Kochergin, V. P., A. V. Kabirov, and **O. N. Skornyakova,** corrosion of iron in fused carnallite, 395
Koebel, N. K., quenching, 292
Koehler, J. S., and **F. Seitz,** dislocations in single crystals, 203
Koerfer, W., elected Member, 210
Koerfer, W. E. F., jun., elected Member, 210
Köhler, W., vacuum metallizing, 384
Kohlgrüber, J., J. Leutbecher, and **T. Türk,** galvanizing-kettle heating, 94
Kohn, A., austenite-grains revelation method, 99
Kohn, A., micro-photometric auto-radiography, 392
Kohn, A. *See* Delbart, G.
Koike, Y., liquid-iron fluidity, 185
Kondic, V. *See* Ohira, G.
Konopicky, K., refractories penetration by slag, 183
Kootz, T., A. Michel, and **H. Rellermeyer,** blast-furnace reactions, 288
Kořán, V., brass replacement by non-magnetic steel, 300
Körös, B., nodular-iron rolls production, 186
Koshiba, S., and **T. Kuno,** ageing of gas-turbine steel, 199; cold rolling and annealing of razor-blade steel, 300
Kosmider, H. *See* Coheur, P.
Kosmider, H., H. Neuhaus, and **H. Kratzenstein,** waste gases in Bessemer steel-making, 184
Kosmider, H., and **H. Schenk,** basic Bessemer studies, 380
Koster, W., and **L. Bangert,** precipitated iron nitride, 99
Kosting, P. R., history of gun-tubes production, 102
Koval'skii, A. E., and **L. A. Kanova,** carbides microhardness measurement, 300
Kozakevitch, P., blast-furnace slags, 183
Krächter, H. *See* Braumann, F.
Kraft, R. W., jun. *See* Wilks, C. R.
Krainer, E., Elektrofona, 388
Krainer, H., electromagnetic sorting of steels, 389; ultrasonic testing, 388; elected Member, 210
Kramer, I. R., investment casting by mercury process, 89; elected Member, 210
Kraner, H. M., blast-furnace refractories, 379
Kratzenstein, H. *See* Kosmider, H.
Krause, G. *See* Albers, H.
Krautkrämer, H., pulsed ultrasonic instruments, 388
Krautkrämer, J., supersonic testing, 389
Krebs, E., steelworks heat and power supplies, 85
Kreshchanovskii, N. S., V. I. Prosvirin, and **E. S. Ginzburg,** effects of boron on Cr–Ni steel, 391
Krevelen, D. W. van. *See* van Krevelen, D. W.
Krieger, J., S. A. Wenk, and **R. C. McMaster,** non-destructive testing of welded joints in ships, 389
Krifka, O., forging ingots, 87
Krisement, O., E. Houdremont, and **F. Wever,** austenite-transformation thermodynamics in Fe–C alloys, 100
Krishnan, A. A., and **V. Prakash,** high-temperature oxidation of Mn–Al steels, 390
Kromer, H. F., chrome-ore mining in Turkey, 284
Kronenberg, K. J., magnetically oriented structures in permanent magnets, 98
Krotov, I. V., iron-bluing film, 384
Krupkowski, A., thermodynamic-data calculation, 204
Kubaschewski, O., and **O. von Goldbeck,** scaling by sulphur, 395
Kühn, C., coal-cleaning processes yield, 285
Kühne, H.-J., plastic deformation, 191
Kumar, R., elected Associate, 210
Kuno, T. *See* Koshiba, S.
Küntscher, W., and **K.-L. Kiesel,** limestone testing, 378
Kunz, H., oxy-acetylene stress relief of welded structures, 291, 383
Kunze, E. *See* Kiessler, H.
Kurz, P. F., flame configuration, 84
Kusaka, K. *See* Yamanaka, N.
Kusakawa, T., cast-iron inoculation with Ca_2Si, 291

Lacourt, R., lubricants testing, 294
Lafon, J. E., forging furnaces, 189
Lagasse, P. E., magnetic study of steels, 203
Lagerberg, G. *See* Josefsson, Å.
Lahari, A. *See* Rao, S. R. R.
Lakomskii, V. I., and **V. I. Yavoiskii,** hydrogen solubility in cupola iron, 390
Lamb, J. C., and **R. Eliassen,** corrosion inhibition by sodium metaphosphate, 395
Lamb, R. M., effect of copper on Mg-treated cast irons, 201
Lamble, J. H., and **S. E. A. Bayoumi,** photoelastic technique, 388
Lamm, O., gamma radiography, 300
Lancy, L. E., plating-waste treatment, 296
Land, T. *See* Barber, R.
Landeau, J., thermal factors in galvanizing, 297
Landers, W. S. *See* Goodman, J. B.
Lane, J. R., high-temperature cast alloys, 301
Lane, T. B., lubricants testing, 383
Lang, C. *See* Ridgion, J. M.
Lang, Ruth, *Book*: "Laboratory and Workshop Notes, 1950–1952," 303
Lapsley, J. T., jun. *See* Thomsen, E. G.
LaQue, F. L. *See* May, T. P.
Larson, H. R., and **J. Chipman,** activities in liquid slags, 290
Lashko, N. F., residual austenite, 393
Laval, C. G. de. *See* de Laval, C. G.
Lavender, J. D. *See* Cina, B.
Lawrie, W. B., dust control in foundry, 291
Lay, J. O., electrolytic deposition of Fe in analysis, 101
Layzer, D., flame propagation, 378
Leadbeater, C. J., sintered parts, 386
Leadbeater, C. J., and **S. Turner,** porosity and permeability of sintered Fe and Fe–Cu, 386
Leak, G. M. *See* Thomas, W. R.
Leake, L. E. *See* Turkdogan, E. T.
Lebrun, M., Plurial hard-facing process, 294
Leder, G., wire and billet mills at Delft, 192
Lee, J. G., shunting machines, 193; *see also* Mills, H. R.
Lee, O., taconite beneficiation, 84, 284
Leech, J. M., tarmacadam standards, 85
Lefebvre, A. G., flat rolling, 293
Legler, C. H., rolling-mill drives, 92
Lehaie, P. H. de. *See* de Lehaie, P. H.
Lehmann, K., H. Scholten, and **O. Wagner,** central materials management, 207
Leigh, F. S., arc furnaces, 87
Lement, B. S. *See* Stark, P.
Lement, B. S., B. L. Averbach, and **M. Cohen,** microstructural changes on tempering Fe–C alloys, 392
Lemke, K., coal-slimes classification and dewatering process, 285; static dewatering of coal, 285

Lena, A. J., sigma phase, 203, 391
Lena, A. J., and **W. E. Curry**, recrystallization and sigma phase, 392
Lena, A. J., and **M. F. Hawkes**, 475° C. embrittlement, 96
Lenel, F. V., H. D. Ambs, and **E. O. Lomerson, jun.**, iron-compacts properties relationship with powders, 385
Leonard, J., productivity in medium-sized foundry, 188
Leone, F. C., operational research, 398
Le Rolland, P., and **E. Planard**, cast-iron elasticity, 201
Leroy and **Combert**, converter-charge blowability, 86
Leroy, P., H. Ruelland, and **M. Cassier**, iron oxide precipitation from fumes, 183
Letort, Y, brick creep, 287
Leutbecher, J. *See* Kohlgrüber, J.
Levasseur, A., "*p*Hp" in corrosion, 206
Levetus, F. B., hydraulic variable-speed drives, 91
Lewicki, W., hydrodynamic lubrication of roller bearings, 294
Lewis, B., flame theory, 84
Lewis, D. A. *See* Spencer, K. A.
Lex, W. I., wire-rope lubrication, 294
Libsch, J. F. *See* Danko, J. C.
Libsch, J. F., and **G. P. Conard**, structure and coercivity, 98
Liebhafsky, H. A. *See* Brissey, R. M.
Liebman, A. J., preparation for painting, 195
Lindblom, Y. *See* Hultgren, A.
Lindroth, G. T., pyrrhotite flotation, 285
Lindsay, R. W., and **J. H. Hoke**, graphite flake-size effects on grey-iron properties, 97
Link, H., X-ray equipment, 389
Lintner, K., and **E. Schmid**, electron emission from metal surfaces, 98
Lips, E. M. H., *Book*: "Engineering Metallurgy," 304
Lips, E. M. H., and **H. van Zuilen**, hardening by cold work, 388
Lismer, R. E., and **F. B. Pickering**, *Paper*: "A Microscopical Examination of Samples of Iron Containing Siliceous Inclusions," 159
Lissell, E. O., and **M. Itzel**, grey-iron castings and test-bars correlation, 291
Little, J. E. O., foundry practice, 186
Littlechild, J. E., coal blending and grinding, 85
Locke, C., and **C. W. Briggs**, moulding-materials heat transfer, 88
Locke, F. A., heating-furnace control, 90
Logan, K. H., cathodic-protection test-methods, 394
Logeling, continuous hydrogen determinator in gases, 396
Logozzo, A. W., stop-offs in chromium plating, 94
Lohrey, C. R., coking at Fontana, 378
Loison, R., coking-coal testing, 286
Loison, R., and **H. Gautier**, pulverized-coal gasification process, 286
Lomerson, E. O., jun. *See* Lenel, F. V.
Longenecker, C., and **H. E. Trout**, Steubenville works, 288
Longstreth, W. C., heat-treatment plant for gun barrels, 90
Lotz, H., pyrometer standards, 182
Low, J. R., jun., microstructural aspects of brittle fracture, 98
Lowe, H. J., and **D. H. Lucas**, electrostatic precipitation, 85
Lubov, B. Ya., ingot solidification-rate determination, 90
Lucas. D. H. *See* Lowe, H. J.
Lucas, G., biographical note, 374
Lucas, G., M. Weddle, and **A. Preece**, *Paper*: "The Liquidus of Metal-Oxide/V_2O_5 Systems and the Mechanism of Accelerated Attack on Metals by V_2O_5," 342
Lücke, K. *See* Dahl, W.
Ludwig, C., agglomeration, 83; iron-ore pelletizing, 269
Lueg, W., drawing-die bearing-length measurement, 192
Lueg, W., and **K.-H. Treptow**, spreading in wire flat rolling, 192
Lufey, C. W., Thermenol alloy, 390
Luft, G., corrosion research in Italy, 205
Lula, R. A. *See* Henke, R. H.
Lund, R. J., and **D. D. Moore**, mineral resources of eastern U.S.A., 181
Lund, R. S. *See* Case, S. L.
Lunn, B., elected Member, 210
Lutherer, O., and **R. J. Reed**, temperature distribution in heat-treatment furnaces, 190
Luthra, G. B. S. *See* Rao, S. R. R.
Lutsch, A., corrosion and sheet-thickness determination by ultrasonics, 302; ultrasonic apparatus, 388
Lynn, A. L., and **J. H. Green**, coal-cleaning plant, 182

McArthur, D. A., A. R. Geiszler, and **J. Upton, jun.**, galvanizing line, 94
McCarroll, S. J., manganese-ore upgrading, 84
McClellan, A. *See* Uhlig, H. H.
McClelland, W. R., Saugus ironworks restoration, 102
McColl, J. R., elected Member, 210
McCrady, D. C., crane control and drive equipment, 383
McCulloch, A., elected Member, 210
McCullough, H. M. *See* Sheinhartz, I.
McDonald, E. C., extensions at Cleveland, 184
Macdonald, N. F., and **C. E. Ransley**, powder Al alloys, 387
McDonald, R., award of Williams Prize, 373
McDonald, V. J. *See* Roberts, H. C.
McDowell, J. R., fretting corrosion, 101
McElgin, J., quenching oils, 91
McFetridge, D., elected Member, 210
Machlin, E. S., strain energy in solid solution, 99
McInerney, M. J., *Letter*: "Iron Oxide Deposition in Open-Hearth Furnaces," 248
McIntosh, G. E., D. C. Hamilton, and **W. L. Sibbitt**, thermal-diffusivity determination in metals, 199
Mack, F., rapid repair of electric furnaces, 290
McKeown, P. J. A., X-ray micro-thermostat, 203
Mackert, A., peeling shafts, 194
McKinsey, C. R., stress-corrosion cracking in welds, 206
McLeod, H., Canadian metal-industry statistics, 102
McLeod, J. M., ore preparation, 84
McMaster, R. C. *See* Krieger, J.
McMillan, J. *See* Aikman, A. R.
McMillan, W. R. *See* Gulbransen, E. A.
McMulkin, F. J., LD converter process, 184
McNeil, D., and **G. A. Vaughan**, coal-tars composition, 85
McWilliam, J. A., welding heat- and corrosion-resistant steels, 294
Maeda, S. *See* Hirone, T.
Maekawa, S., and **Y. Kikuchi**, FeO determination in acid slag, 303
Maekawa, S., and **T. Suzuki**, sampling for spectrographic analysis of iron and steel, 396
Magers, W. *See* Frede, L.
Maguire, J. J., corrosion prevention in boiler fittings, 100
Mahler, E. A. J., coke ovens and Alkali Act, 85
Maire, R., carbon refractories, 182; silicon carbide, 286
Makrides, A. C. *See* Hackerman, N.
Mallet, Thérèse. *See* Audubert, R.
Maman, A., lubrication tester, 294
Mamecki, J., slag thermodynamics, 289
Mangen, J. R., intercrystalline corrosion of Cr–Ni steels, 394
Mantovani, G., vapour-phase inhibitors, 205; *see also* Bighi, C.
Marek, C. T. *See* Sayre, E. D.
Marin, J., creep-test data interpretation, 95; *see also* Pao, Y.-H.
Marincek, B., nodular-graphite formation, 187
Markovic, T., soil-moisture effects in corrosion rates of Fe and Pb, 394
Markovic, T., and **P. Kirkov**, double-layer formation on buried Fe and Pb electrodes, 394
Markus, G., polarographic electrode-potentials calculation, 395
Marous, J. C., and **E. F. Merrill**, taconite-grinding motors, 285
Marris, A. W., turbulent heat transfer, 378
Marsh, G. A., hydrogen blistering, 101
Marsh, G. E., hot-face insulation, 86
Marshall, A., slabbing/blooming and continuous billet mills at Consett, 173, 382
Marshall, D. R., elected Associate, 210
Marshall, P. R., pore-size distribution of sintered materials, 385; stainless steel powder, 386
Martin, R., gas-analysis apparatus, 397
Martin, Z. G., fatigue resistance of welded structures, 388
Martinod, H. *See* Hausseghy, L.
Marton, S. *See* Harrison, L.
Marx, W., strain tester, 388
Masi, O., weld radiography, 198
Masi, O., and **A. Ferri**, sonic determination of intercrystalline corrosion, 205
Masters, J., elected Member, 210
Matas, S. F., and **M. S. Ribera**, brightening processes, 383
Mathes, K. P., *Book*: "Werkzeugmaschinen für Metallbearbeitung," 103
Mathieson, R., electrical maintenance at Consett, 174, 383
Matsushita, Y. *See* Mori, K.
Matteoli, L., corrosion research, 205
Matthaes, K., magneto-inductive sorter, 96
Matthews, N. A. *See* Wilks, C. R.
Matting, A., and **K. Becker**, metal-spraying study, 94
Mattson, R. L., residual stress effect on fatigue, 388
Mattson, R. L., and **W. S. Coleman, jun.**, shot-peening and residual-stress effects on fatigue, 197
Mavis, F. T. *See* Peck, C. F., jun.
Max-Planck-Institut, *Book*: "Atlas zur Wärmebehandlung der Stähle," 398
May, T. P., and **F. L. LaQue**, measured potentials in corrosion determination 101
Mayberry, J. H., costing in galvanizing, 297
Mayer, G. *See* Steven, W.
Mayer, K. E. *See* Knüppel, H.
Mayer, K. E., and **H. Knüppel**, basic Bessemer process in Germany, 380
Mayne, J. E. O., and **J. W. Menter**, corrosion inhibition by sodium hydroxide, 206
Meggers, W. F. *See* Scribner, B. F.
Mehl, R. F. *See* Dieter, G. E., *also* Epremian, E.; Ransome, J. T.
Meinel, W. J., cold extrusion, 91
Mejnet, G., effect of carbon on **S** curves, 99
Meldrum, C. E., press safety devices, 382
Menter, J. W., electron diffraction, 392; *see also* Mayne, J. E. O.
Meredith, J. W., elected Member, 210
Merikanto, B. *See* Kinnunen, J.
Merrill, E. F. *See* Marous, J. C.
Merriman, A. D., and **J. S. Bowden**, metallurgical glossary, 398
Mescher, J. A., core blowing, 89
Messenger, J. H. *See* Fielden, C. F. R.
Messenger, J. H., and **C. F. R. Fielden**, auxiliary-motors standardization, 383
Metz, A., optical instruments, 388
Meyer, G. A. H., coal-preparation supervision, 285
Meyer, K., Rockwell error-free tester, 198
Meyer, R., powder metallurgy, 298
Meynadier, H., Star blast-furnace top, 379
Mican, J. S., hot-rolling theory, 192
Michaud, G. G., and **L. M. Pidgeon**, selective reduction of iron in ilmenite, and rutile O pressure, 86
Michel, A. *See* Kootz, T.
Michel, A. H., and **J. Papier**, transformations in tempering, 99

Mikashima, H., cast steel, 201
Milburn, G. S., machine-moulded pig beds, 288
Miller, G. L. *See* Cox, F. G.
Miller, L. H., elected Member, 210
Miller, R. C., jun., and **A. W. Brunot**, surface-preparation processes effects on fatigue, 299
Miller, R. D., bright nickel plating, 296
Miller, W. E., rolling-mill motors, 382
Mills, H. R., and **J. G. Lee**, mechanical trimmers for iron-ore ships, 181
Milner, G. W. C., and **A. A. Smales**, determination of niobium in stainless steel, 396
Milton, R. J., elected Member, 210
Mintrop, R. *See* Hüttemann, P.
Miodownik, A. P., continuous cooling of steel, 355
Mirt, O. *See* Rapatz, F.
Mitra, M. S., and **M. G. Fontana**, deformation in stainless steels, 299; wire-drawing effects on stress/strain curve, 299
Mitsche, R., non-destructive testing, 388
Mitsuhashi, T., T. Nakashima, and **Y. Shiraishi**, high-voltage A.C. spectrographic arc source, 206
Mitsuhashi, T., M. Ueno, R. Nakagawa, and **K. Tsuya**, watch-spring steel, 201
Mitsuyama, K. *See* Jo, H.
Mittli, E., radiographic instrument, 388
Miyamoto, Y. *See* Yoshizaki, K.
Moak, W. D. *See* Pepkowitz, L. P.
Modin, S., electron microscopy, 202
Modylevskaya, K. T. *See* Frantsevich-Zabludovskaya, T. F.
Mohnkern, G. E. *See* Chenault, R. L.
Molchanova, E. K. *See* Shraiber, D. S.
Molland, P. A., elected Member, 210
Möller, H., W. Grimm, and **H. Weeber**, betatron, 96
Molloy, J. A., elected Member, 210
Mond Nickel Co, Ni-Resist, 391
Moore, D. D. *See* Case, S. L., *also* Lund, R. J.
Moore, D. G., porcelain enamels resistance to weathering, 196; *see also* Strauss, S. W.
Moore, L. C., elected Member, 210
Moore, J. P., welding stainless steels, 193
Mordike, B. L., elected Associate, 210
Moreau, J. *See* Bardolle, J.
Morelle, J. M., oxygen cutting, 295
Morey, R. E., H. F. Bishop, and **W. S. Pellini**, solidification of shell-moulded castings, 89
Morgan, E. R. *See* Shyne, J. C.
Morgan, V. T., metal-powders particle-size analysis, 384; powder-metal filter elements, 385
Morgis, G. G. *See* Davenport, S. J.
Mori, K., and **Y. Matsushita**, electrical conductivity of binary liquid slags, 290; electrical conductivity of liquid slags, 290
Mori, T. *See* Sawamura, H.
Morissey, H. A. *See* Kinelski, E. H.
Morissey, H. A., and **R. E. Powers**, sinter quality in relation to moisture and coke contents, 84
Morita, T. *See* Ozawa, M.
Morris, J., elected Associate, 210
Morris, W., W. A. Tiller, J. W. Rutter, and **W. C. Winegard**, dendritic growth in alloys, 393
Morrison, A. *See* Garrett, C.
Morrison, A. W. *See* Aikman, A. R.
Mortara, E., pressure-tight nodular-iron castings, 187
Mosquera, J. M. B. de C., J. M. F. Casas, and **J. A. B. Sopena**, microradiography of ores and sinters, 378
Mossoux, R., and **E. Progneaux**, isothermal tempering, 190
Motoyama, M., automobile steels, 200
Mott, R. A., coal and coke analysis, 397; coke combustion in blast-furnace, 183
Muir, H., B. L. Averbach, and **M. Cohen**, elasticity and yield of hardened steels, 387
Muldawer, L. *See* Joumot, F. E., jun.
Muller, E. A. W., cameras for fine-structure determination, 388; magnetic-powder testing, 388; radio-isotopes in testing, 388
Müller, H., cross-country mill modification, 293; tar/dolomite segments for arc-furnace relining, 290
Muraca, R. F. *See* Gardner, D. G.
Murray, G., and **B. B. Hundy**, deep-drawing properties of sheet steel, 170
Murray, P., ceramics hot pressing, 386; *see* also Allison, E. B.; Williams, L. S.
Murray, P., E. P. Rodgers, and **A. E. Williams**, hot pressing refractory oxides, 298
Myhill, A. R., refractories, 182
Myskowski, E. T., H. F. Bishop, and **W. S. Pellini**, chill-action studies, 90

Nabeshima, S. *See* Tagaya, M.
Nachman, J. F., and **W. J. Buelher**, rolling Fe–Al sheet, 382
Nacken, M. *See* Piwowarsky, E.
Nacken, W., multi-hole slip-cone wire-drawing machines, 382
Nagaoka, K., growth in nodular iron, 203
Nagashima, H., aluminium as deoxidizer, 381
Nakagawa, R. *See* Mitsuhashi, T.
Nakagawa, Y., heating of arsenic steels, 301
Nakahara, M. *See* Haseba, S.
Nakamura, H. *See* Sanbongi, K., *also* Takase, T.
Nakamura, M., energy consumption in Héroult furnaces, 290; refractories, heat-transfer determination, 287
Nakamura, S. *See* Takaki, H.
Nakamura, Y. *See* Takaki, H.
Nakashima, T. *See* Mitsuhashi, T.
Namba, E., relationship between malleable-iron properties and graphite-nodule size, 391
Nandy, K. P., vapour-phase-film thickness determination, 296
Nanni, T., and **A. Compostella**, cathodic-protection economics, 205
Narduzzi, E. D., and **G. Welter**, stress/strain relations in pressure vessel, 200
National Bureau of Standards, hot-gas energy-transfer symposium, 84; mass and weight standards, 302; protection in radiography, 389; standard X-ray diffraction powder patterns, 203
National Physical Laboratory, balances, weights, and weighing, 397; volumetric glassware, 397
Negretto, P., corrosion inhibitors, 205
Nehl, F., and **A. Rose**, transformation diagrams for stressed welded structures, 204
Neifert, H. R. *See* Horger, O. J.
Nepper, M., forging-ingots heterogeneity, 87
Nesbitt, E. A., H. J. Williams, and **R. M. Bozorth**, permanent-magnet properties of single-crystal Fe_2NiAl, 393
Nesnidal, J., temperature-distribution measurement in heat-treatment furnaces, 86
Nettell, D. F., *Letter*: "Automatic Handling of Numerical Data," 358
Neuhaus, H. *See* Kosmider, H.
Neuhaus, W., bending of spring wires, 298
Neuville, nodular-iron rolls, 92
Nicholson, M. E., iron-boron alloys, 204; nucleation of pearlite, 202
Nicolas, P., exothermic feeding compounds, 188; moulding-sand behaviour at high temperatures, 381; permeabilities of sand mixtures, 381
Nicols, C. W., jun. *See* Killingsworth, R. B.
Niedzwiedski, A., low-temperature hardening, 189
Nielsen, J. P., recrystallization nuclei, 203
Nielsen, M. L., and **I. B. Johns**, laboratory arc-melting furnace, 202
Niewland, P. E. A. van. *See* van Niewland, P. E. A.
Nijhawan, B. R. *See* Parthasarathi, M. N.
Niklewski, B. K., and **R. H. Ashby**, colours stability in titania-opacified enamels, 95
Nippes, E. F., W. F. Savage, G. Grotke, and **P. M. Robelotto**, flash-weld cooling rates, 294
Nishada, M. *See* Kawai, T.
Nishihara, M. *See* Takao, Z.
Nishihara, T., and **K. Endo**, fatigue-failure theory, 96
Noakes, G. E., X-ray fluorescent analysis of stainless steels, 102
Noble, R. E., cold rolling, 382
Noritake, T., elected Member, 210
Norlindh, S. E. M., elected Member, 210
Norris, A. H. *See* Peacock, J. A.
Norris, H. B., betatron in testing, 199
Northup, M. S. *See* Feely, F. J.
Nusbaum, C., and **W. Brenner, jun.**, rolling texture of mild-steel sheets, 383
Nutting, J., electron microscope in metallography, 98
Nydahl, F., sulphur determination by chromatography / barium - chloride method, 206

Ochsenfeld, R., watt-loss error determination, 96
Ödman, O. H., Brazilian ore deposits, 83
Odqvist, F. K. G., creep/stress effects, 390
Ogburn, F., electroplating, 196
Ohira, G., and **V. Kondic**, molten-metals gas-content determination, 188
Ohtani, M. *See* Sanbongi, K.
Oka, T. *See* Sawamura, H.
Okada, A. *See* Okamoto, M.
Okada, M., and **Y. Arata**, graphitization of weld heat-affected zone, 93
Okada, M., T. Kitani, and **Y. Ito**, effect of hydrogen weld-bead porosity, 92
Okamoto, G. *See* Takase, T.
Okamoto, M., and **A. Okada**, electrical properties of iron grid materials, 300
Okamoto, M., and **N. Shirai**, case hardening in C_2N_2O, 190
Okamoto, M., and **T. Tottori**, elastic modulus and structure of cast iron, 202
Oki, S., cast-iron hot-tearing test, 391
Okubo, S. *See* Durelli, A. J.
Okura, Y., determination of nitrogen in steel, 396
Oliver, D. A., effects of impurities in low-alloy steels, 163
Oliver, D. A., and **S. C. Wilsdon**, stainless steel powders, 386
Ollivet, A., Sendzimir galvanizing, 94
Omori, A. *See* Tanimura, H.
Oppelt, M. *See* Houdek, F.
Orazio, A. J. D'. *See* D'Orazio, A. J.
Orbzut, J. J., electrostatic detearing, 95
Orehoski, M. A., N. R. Arant, and **J. A. Pusateri**, ingot cracks in killed fine-grained steel, 290
Organisation for European Economic Co-operation, applied research in Europe, U.S., and Canada, 398; corrosion in chemical and petroleum industries, 394; U.S. foundries, 90
Orland, J., austenite stability in Ni steels, 393
Orowan, E., dislocations, 204
Osgood, W. R., *Book*: "Residual Stresses in Metals and Metal Construction," 399
Ostroukhov, M. Ya. *See* Bardin, I. P.
Otani, K., cast-iron rolls, 192
Overstrud, R. M., cupola fly-ash suppression by water curtain, 88
Ozawa, M., and **T. Morita**, welding arc, 294

Paauw, D. de. *See* De Paauw, D.
Padden, T. R., and **F. M. Cain**, cathodic vacuum etching, 295
Pahlitzsch, G., and **J. Appun**, twin-fluid two-way cooling in grinding, 194
Paliwoda, E. J., machinability dependence on chemical composition, 383
Pao, Y.-H., and **J. Marin**, creep-testing machine, 95

Papier, J. *See* Michel, A. H.
Papoff, P. *See* Riccoboni, L.
Paranjpe, V. G., impurities hindrance of grain-boundary migration, 203
Parfenov, G. S. *See* Balezin, S. A.
Paris, B. L., ceramic coatings for aircraft power units, 196
Parker, E. R., and **T. H. Hazlett,** solution hardening, 98
Parker, R., elected Associate, 210
Parkes, A. R., malleable-iron practice, 187
Parry, G. W., elected Associate, 210
Parry, V. F. *See* Goodman, J. B.
Parthasarathi, M. N., and **B. R. Nijhawan,** nodular-graphite growth, 203
Pascal, J., cupola process, 291
Paschkis, V., solidification of cylinders, 90
Pascoe, W. R. *See* Seymour, R. B.
Pask, J. A., and **M. F. Warner,** differential thermal analysis, 286
Passolt, H. H., and **A. T. Baldwin,** preplating effects on galvanized steel wire, 195
Pastonesi, G., corrosion in chemical industry, 205
Paterson, K., Seraphim project at Appleby-Frodingham, 287
Patterson. *See* Piwowarsky, E.
Patterson, D. P. *See* Holley, J. L.
Pattison, J. R., internal-friction tester, 299
Patton, W. G., bar-mill equipment, 382; scrap baler, 92; slabbing mill, 192; vacuum oxygen-storage tanks, 397
Paul, H., coal classifier, 285
Pawlowski, S., insulating foam refractories, 379
Paxton, H. W. *See* Busby, C. C.
Payne, R. J. M., small tensile specimens preparation, 196
Peacock, J. A., and **A. H. Norris,** rolling mills at Normanby Park, 92
Pearson, J. *See* Turkdogan, E. T.
Pearson, J., and **Rinehart, J. S.,** hardness plateaus and twinning in explosively loaded steel, 387
Pearson, S. C., ore discharging and handling plant at Consett, 174, 377
Pech, J. *See* Štorek, V.
Pechman, A., ceramic high-temperature coatings, 95; new ceramic coatings, 95
Peck, C. E., steel-strip heating-methods comparison, 189
Peck, C. F., jun., J. M. Bonetti, and **F. T. Mavis,** temperature-stress analysis in iron work rolls, 192
Pellini, W. S. *See* Apblett, W. R., *also* Brandt, F. A.; Johnson, W. H.; Morey, R. E.; Myskowski, E. T.; Puzak, P. P.
Pellini, W. S., and **E. W. Eschbacher,** peening final butt-weld pass, 194
Pendray, W. O. *See* Brisby, M. D. J.
Penner, S. S., infra-red emissivity of diatomic gases, 84
Penner, S. S., M. Gilbert, and **D. Weber,** low-pressure-flames spectroscopy, 84
Pennington, P. G., elected Member, 210
Penrice, T. W., and **D. H. Shute,** testing ceramic materials, 387
Pensotti, C., and **G. Pogatschnig,** nodular-iron annealing curves, 187
Pentz, P. G., shell-moulding resins, 188
Pepkowitz, L. P., and **W. D. Moak,** trace-carbon determination in metals, 302
Pérans, Jeanne. *See* Audubert, R.
Perry, J., cold extrusion, 91
Peter, W. *See* Rose, A.
Peters, H., soaking-pit maintenance costs, 381
Peters, J. F., coke reactions in blast-furnace, 86
Peterson, R. E., stress analysis and fatigue, 95
Petit, D., new-type blast-furnace bell, 287
Petitfrère, M., oval-square roughing-down, 293; straightening mills, 193
Petrocelli, J. V., and **G. Tatoian,** polarography of nickel-plating baths, 396
Petrov, I. P., preheating cupola blast, 186
Petterson, O., plate-deflection formula, 298
Pfeiffer, H. G. *See* Brissey, R. M.
Pfleider, E. P., cube-diamonds orientation in drill bits, 284
Pfleider, E. P., and **R. L. Blake,** diamond-bit cutting action, 284
Philbrook, W. O. *See* Goldman, K. M.
Phillips, A. *See* Waisman, J. L.
Phillips, W. M., plating in automobile industry, 296
Physical Society, *Book*: "Rutherford," 103
Piaskowski, J., nodular-iron production in cupola by Mg-bearing additions, 88
Pickering, F. B. *See* Lismer, R. E.
Pidgeon, L. M. *See* Curlook, W., *also* Michaud, G. G.
Piearcey, B. J., elected Associate, 210
Pierce, R. R., protective coatings, 93
Pigeau, ladle refractories wear, 379
Pineau, A., gas turbines as blowers and power generators, 293
Pinner, W. L., finishing problems, 296
Piontelli, R., electrode-polarization determination, 296; passivation, 205
Pitkin, W. R. *See* Green, E. C., *also* Robins, D. A.
Piwowarsky, E., and **M. Nacken,** liquid-metal viscosity, 185
Piwowarsky, E., and **Patterson,** sand-moulds hardness testing, 187
Piwowarsky, E., and **H. L. Roes,** manganese-steel castings, 381
Planard, E. *See* Le Rolland, P.
Planchard, P., clay linings, 182
Plankenhorn, W. J., effect of ceramic coatings on fatigue, 299
Plch, J., continuous-flow cupolas, 186
Plyler, E. K. *See* Benedict, W. S.
Pocock, N. J. B., elected Associate, 210
Pode, E. J., steel and gas industries integration, 182
Podgornik, S. *See* Klimec, J.
Podoinikova, K. V. *See* Chernyi, A. T.
Pogatschnig, G. *See* Pensotti, C.
Pohlman, R., Sonometer, 388; ultrasonic tester, 96; ultrasonic testing, 388; visual ultrasonic testing, 388
Polakowski, N. H., rolling theories, 92
Polek, Z., mill-scale removal by high-pressure water, 293
Polgreen, G. R., magnetic powders, 384
Pomey, J., carbides formation in bainite transformation, 204, 393
Poole, L. K., sigma phase, 203
Pope, M., power-plant efficiency, 92
Post, C. B., elected Member, 210
Pourbaix, M., corrosion prevention, 205
Powell, H. M., cathodic-protection instrumentation, 394; cathodic protection of internal surfaces, 302
Powell, R. G., C. M. Adams, jun., and **H. F. Taylor,** shell-moulding studies, 89
Powers, R. E. *See* Kinelski, E. H., *also* Morissey, H. A.
Prakash, V. *See* Krishnan, A. A.
Prat, J., dust removal from cupola gases, 188
Pratley, H. H. L. *See* Roderick, J. W.
Preece, A. *See* Lucas, G.
Presern, A., elected Member, 210
Price, P. H. *See* Thring, M. W.
Prime, J. B., jun., cathodic protection of power plants, 205
Probyn, F. E. C., elected Member, 210
Production Engineering Research Association, electropolishing bibliography, 194
Progneaux, E. *See* Mossoux, R.
Prosvirin, V. I. *See* Kreschanovskii, N. S.
Prot, M., fatigue test, 96
Pumphrey, W. I., continuous cooling of steel, 353; welding metallurgy, 294
Pusateri, J. A. *See* Orchoski, M. A.
Puzak, P. P., and **W. S. Pellini,** notch-bend testing, 194
Pyatt, E. C., pyrometers, 182

Quan, J. T., X-ray comparator, 203
Quarrell, A. G. *See* Hickley, R. H.
Que, F. L. La. *See* LaQue, F. L.

Raaflaub, H. E. *See* Barnes, B. D.
Rabaté, H., micaceous iron oxide pigment, 196
Rädeker, W., cracking by temperature changes, 197
Radtke, R., nodular-iron production method, 186
Raeuchle, R. F. *See* von Batchelder, F. W.
Raine, T. *See* Brownlee, L. D.
Rajon, tar for converters, 86
Rajon and **Tavard,** manganese-free and manganese irons in converter, 86
Ransley, C. E. *See* Macdonald, N. F.
Ransome, J. T., and **R. F. Mehl,** forgings fatigue statistical properties, 197
Rao, S. R. R., P. B. Datta, G. B. S. Luthra, and **A. Lahari,** phosphorus reduction in coking coal, 378
Rapatz, F., and **O. Mirt,** plain carbon tool steels, 391
Rathenau, G. W., and **G. Baas,** grain-growth study by emission microscope, 98
Rauch, W. G., needle thermocouples, 182
Read, W. T., jun., and **W. Shockley,** dislocations, 203
Reboux, P. *Book*: "Phénomènes de Fluidization," 103
Recht, M., tar/dolomite converter linings, 184
Redwood, R., elected Member, 210
Reed, D. J. *See* Rose, E. H.
Reed, R. J. *See* Lutherer, O.
Rees, W. D., plastic soaking-pit cover linings, 188
Rees, W. P., B. E. Hopkins, and **H. R. Tipler,** *Paper*: "Tensile and Impact Properties of Fe–Si, Fe–Ni, Fe–Cr, and Fe–Mo Alloys of High Purity." *Discussion*, 163. *Correspondence*, 167. *Authors' Reply*, 168
Regnault, J., foundry working conditions, 188
Rehngvist, N. G., elected Member, 210
Reinacher, G., hot-metal microscopy, 98
Reiter, S. F. *See* Guard, R. W.
Rekar, C. F., elected Member, 210
Rellermeyer, H. *See* Kootz, T.
Remy, G., induction surface hardening, 91
Rew, R. *See* Gooding, R. G.
Reynolds, D. A. *See* Brown, R. L.
Ribera, M. S. *See* Matas, S. F.
Riccoboni, L., P. Papoff, and **V. Genta,** polarographic control of corrosion kinetics, 205
Rice, G. *See* Garrett, C.
Richard, A., converter dolomite plant, 286
Richard, K. *See* Thum, A.
Richards, J. A. *See* Jeffrey, R. S. M.
Richards, L. E. *See* Strauss, S. W.
Richards, R. G., and **J. White,** spinel phases, 287
Richards, V. L., plating-rectifiers output fluctuations, 296
Richardson, L. D., cermets, 300
Richter, A. *See* Strähuber, F.
Riddervold, H. W., elected Member, 210
Ridgion, J. M., iron-ore pelletizing, 268
Ridgion, J. M., E. Cohen, and **C. Lang,** *Paper*: "The Development of a Pelletizing Process for Fine Iron Ores." *Discussion*, 265. *Authors' Reply*, 270
Ridley, R. W., creep of Mo-steel pipe, 390
Ridout, P. J. *See* Wilson, S. C.
Riedel, J. Y., tools heat-treatment, 190
Riediger, B., fuel oils, 182
Rigby, G. R. *See* Davis, W. R.
Riley, H. L., elected Member, 210
Riley, R. V., and **B. T. Gillyat,** centrifuge for melting and solidification research 291
Riley, T. H., gas holders, 286
Rinehart, J. S. *See* Pearson, J.
Rinesch, R. *See* Klepp, F.
Rion, Timken roll-neck bearings, 92
Risch, T. A., and **A. E. Dohna,** consumable insert in butt welding, 294
Ritzau, G., thermoelectric force in sintering, 385
Rizika, J. W., thermal lags in flowing systems, 84
Robelotto, P. M. *See* Nippes, E. F.
Robert, O., French and international units 398

Roberts, A. L. *See* Baxter, J. R., *also* Cass, F. H.
Roberts, D. A., elected Associate, 210
Roberts, E. C., N. J. Grant, and **M. Cohen,** creep/tempering relationships in hardened Cr steels, 382
Roberts, E. G., elected Associate, 210
Roberts, H. C., and **V. J. McDonald,** large fatigue machine, 96
Roberts, J. T., abrasion testing of porcelain enamels, 196
Robins, D. A., W. R. Pitkin, and **I. Jenkins,** powder Ti and Ti alloys, 387
Robinson, H. A., cathodic protection and galvanizing, 196
Robinson, J. F., elected Associate, 210
Roche, E. A. *See* Best, G. E.
Rodder, W., pipe mills, 383
Roderick, J. W., and **H. H. L. Pratley,** rolled-joists behaviour in plastic range, 197
Rodgers, E. P. *See* Murray, P.
Rodman, C. J., and **F. J. Schollenberger,** strength of vitreous-enamelled steel, 94
Roebling, F. W., elected Member, 210
Roes, H. L. *See* Piwowarsky, E.
Roesch, K., gas evolution at mould surface, 188; spectroscopy of graphitization-affecting elements, 396
Röhrig, H. *See* Hendus, H.
Roll, F., Mo-, Mn-, or Cr-containing whiteheart malleable, 201
Roll, H. J., gear induction hardening, 90
Rolland, P. Le. *See* Le Rolland, P.
Romanoff, M. *See* Denison, I. A.
Ronay, B., and **W. E. Clautice,** test-racks for steam exposures, 199
Roos, A., silicate inclusions in grey iron, 201
Rose, A. *See* Jellinghaus, W., *also* Nehl, F.; Wever, F.
Rose, A., W. Peter, and **W. Strassburg,** *Book*: "Atlas zur Wärmebehandlung der Stähle," 398
Rose, E. H., and **D. J. Reed,** sinter-quality control, 284
Ross, H. McG., automatic hysteresis-loop plotter, 198
Ross, S. T., R. P. Sernka, and **W. E. Jominy,** microstructure and hardenability, 393
Rosselle, D. T., damage minimizing in cathodic protection, 205
Rousseau, L. B., wire annealing and patenting salt baths, 191
Rozhnov, A. I. *See* In'shakov, N. N.
Rudberg, E., effects of alloying elements in low-alloy steels, 164; *see also* Hultgren, A.
Rudberg, E., and **R. Arpi,** stress-corrosion cracking, 101
Rüdiger, O. *See* Hinnüber, J.
Rudorff, D. W., and **H. Drubba,** Sparcatron machining, 93
Rueckel, W. C., and **W. A. Vogt,** LD converter process prospects in U.S.A., 288
Ruelland, H. *See* Leroy, P.
Rupert, E. J. *See* Ipsen, H.
Russell, J. E., fracture of steel, 388
Rust, H. H., electro-acoustic testing, 389
Rutowski, W., sintered permanent magnets, 384
Rutter, J. W. *See* Morris, W.
Rybasenko, I. D., and **M. N. Vitkovskii,** cast-iron strengths at various castings locations, 391

Sachs, G., elected Member, 210
Sachs, K. *See* Hopkins, A. D.
Sagisman, M., martensite hardness, 99
Saheki, M., and **T. Yonezawa,** sampling molten pig, 183
Saito, T., effects of oxygen in iron and steel, 300; pressure-vessel steels, 301; *see also* Abe, F.
Saito, T., and **Y. Kawai,** liquid-slag viscosity, 289
Sajch, L., and **F. Vána,** Czechoslovak coking-plant and blast-furnace performances, 182
Sakagami, R., electrochemical study of liquid slags, 184
Sales, H. *See* Hüttig, G. F.
Salli, I. V. *See* Graifer, E. Z.
Samuelson, D. H., cold heading, 292
Sanbongi, K., M. Ohtani, and **H. Nakamura,** silicon equilibrium between iron, slag, and gas, 380
Sanderson, L., metallurgical progress and steam engineering, 391
Sandrinelli, R., corrosion by drinking waters, 205; soil-corrosivity examination, 205
Sandrinelli, R., P. Sbrascia, and **A. Andreini,** water corrosion-activity determination, 205
Sanford, E. A., and **O. J. Britton,** chemical resistance of glass fused to steel, 196
Saniter, F. H., iron-ore pelletizing, 265
Sargent, J. K., and **J. W. Stewart,** water demineralization system, 297
Sasaki, S., oxidation of heated carbon steel, 395
Sasaki, S., and **H. Adachi,** oxidizing roasting of Japanese ores, 285; synthetic fayalite, 285
Sass, R. L., and **S. L. Eisler,** chromium sulphate complex in plating baths, 296
Sato, K. *See* Yamanaka, N.
Saunders, O. A., flame-radiation laboratory, 84
Savage, L. H. W., and **M. D. Ashton,** *Paper*: "Cooling of 15-Ton Ingots between Teeming and Stripping," 132
Savage, W. F. *See* Nippes, E. F.
Savarre, Maerz-type burners, 289
Sawamura, H., Y. Hotta, and **T. Oka,** S-H cast iron, 201
Sawamura, H., T. Mori, T. Fukase, and **S. Yamamoto,** Fe–As–C system, 301
Sawamura, H., and **J. Sawamura,** iron/slag reactions, 288
Sawamura, J. *See* Sawamura, H.
Sayer, C. E., *Paper*: "The Gas-Turbo-Driven Blower For Blast-Furnace Service," 359; elected Member, 210
Sayre, E. D., and **C. T. Marek,** moisture effects on sand properties, 88
Sbrascia, P. *See* Sandrinelli, R.
Scanlan, J. P. *See* Steinitz, R.
Scarola, P. *See* Brandt, C. C.
Schaaber, O., austenite transformations, 99
Schaden, H., converter plant for LD process, 87
Schaefer, F. C., reciprocating furnaces, 90
Schäfer, O., coal washing, 285
Schenk, H. *See* Kosmider, H.
Schepers, A., and **W. Bartholome,** micro/macro hardness relationship in crystallites, 300
Scherer, R., and **K. Bungardt,** boron-steel study, 200
Schevo, B. A. *See* Fabrykowski, Z. J.
Schick, O., relining basic arc furnaces, 290
Schieroni, F., corrosion protection, 205
Schikorr, G., copper sulphate test for galvanized coatings, 297
Schimmer, L. *See* Schultze, W.
Schleicher, A., early blast-furnace reconstruction at Diosgyör, 303
Schlossberg, L., corrosion testing, 301
Schlosser, E., non-destructive testers, 388
Schmahl, N. G., Fe–S–O system, 290
Schmid, E. *See* Lintner, K.
Schneider, K., and **H. Kessler,** reaction of solid Fe with liquid Zn-containing Al alloys, 94
Schoefer, E. A., cast alloy tops for hot spots, 300
Scholey, C., elected Member, 210
Scholl, K., cast-iron rolls repair by welding, 295
Schollenberger, F. J. *See* Rodman, C. J.
Scholten, H. *See* Lehmann, K.
Scholtz, W. F., industrial noise, 102
Schönmüller, J.-R., coal preparation, 285
Schönmüller, S.-R., coal-middlings separation on classifier, 285
Schrader, H., and **B. N. Bose,** phosphorus solid solubility in iron, 204
Schrader, H., and **D. R. Dhanbhoora,** isothermal heat-treatment, 189
Schrader, H. W. *See* Hanson, H. P.
Schreiber, T. P. *See* Fry, D. L.
Schröder, H., determination of Mn, 396
Schröder, K. *See* Baake, R.
Schuler, K. E., H_2–O_2 flame reactions, 84
Schultze, W., and **L. Schimmer,** micro/macro hardness relationship, 299
Schulz, L. G., X-ray tube for single-crystals examination, 203
Schumann, H., diffusion columnar grain in steel, 392; hydrogen yield point, 390
Schuyer, J., and **D. W. van Krevelen,** coal calorific value, 85
Schwabe, W. E., arc-furnace optimum-current determination, 185
Schwarzkopf, P., infiltration in powder metallurgy, 385
Schwiete, H. E., and **L. Zagar,** sulphur behaviour in blast-furnace slag and slag wool, 86
Schwope, A. D., alloy structure, 98
Scortecci, A., and **C. Durand,** colour micrographs of nodular iron, 202
Scott, D. W., and **A. L. Wesner,** Mesabi taconites, 377
Scribner, B. F., and **W. F. Meggers,** spectrochemical-analysis literature index, 102
Scriven, H., elected Member, 210
Scuri, L., temperature effects in impact tests, 197
Seal, A. K., elected Associate, 210
Sedlaczek, H. *Book*: "Das Walzen von Edelstählen," 103
Séférian, D., *Book*: "Les Soudures," 207
Segsworth, R. S., dual-frequency induction heating, 381
Seiter, J. G., finishing by vacuum metallizing, 297
Seitz, F. *See* Koehler, J. S.
Seki, F. *See* Uchiyama, M.
Seleron, electric-furnace lining clays, 290
Sellier, E., argon-arc welding, 294
Semple, J., one-coat white enamel, 95, 196
Sen, B., Keonjhar manganese ore, 377
Sen H. K., flame temperature, 84
Serbrennikov, N. N., and **P. V. Gel'd,** ζ-phase heat capacity in Fe–Si system, 394
Serfass, E. J. *See* Gardner, D. G.
Sernka, R. P. *See* Ross, S. T.
Sevick, G. *See* Small, L.
Sewell, R., iron and steel production developments in Russia and East Germany, 288
Sewerynski, B., self-fluxing sinters, 377
Seybolt, A. V., oxygen solubility in α-iron, 97
Seybolt, A. V., and **R. L. Fullman,** oxygen solid solubility in transition metals 204
Seymour, R. B., W. R. Pascoe, and **R. H. Steiner,** corrosion in presence of dispersed and solid sulphur, 100
Seymour, R. B., and **R. H. Steiner,** mastic coatings, 298
Shank, M. E. *See* Clough, W. R.
Sharon, A. V., abrasion resistance of porcelain enamels, 196
Sharpe, R. S., radio-isotopes, 389
Shcherbakova, N. S. *See* Shraiber, D. S.
Sheinhartz, I., H. M. McCullough, and **J. L. Zambrow,** powder-metallurgy lubricants evaluation, 196
Shepard, A. P. *See* Vanderpool, H.
Shepherd, H. H., plastics in foundry, 89
Sherman, J., fluorescent X-ray intensity and chemical composition, 102
Sherwood, P. W., water-corrosion prevention in oil refineries, 206
Shevlin, T. S. *See* Greenhouse, H. M.
Shibata, Z. *See* Yagihashi, T.
Shimokawa, Y., oxygen vacuum-fusion analysis furnace, 206
Shimomura, T., cupola/reverberatory-furnace duplexing for malleable iron, 186
Shinji, K., slag-basicity determination, 289
Shirai, N. *See* Okamoto, M.
Shiraishi, Y. *See* Mitsuhashi, T.
Shnay, R. C., and **S. L. Gertsman,** nodular-iron risering, 89
Shockley, W. *See* Read, W. T., jun.

Short, J., brittle-strength notched-bar tests, 197
Shorter, A. J., mullite formation, 286
Shpak, T. M. *See* Bunin, K. P.
Shraiber, D. S., E. K. Molchanova, and **N. S. Shcherbakova,** electron microscope in metallography, 202
Shreir, L. L., cathodic protection, 205; corrosion and design, 205
Shuldener, H. L., hot-water-piping conditions, 101
Shute, D. H. *See* Penrice, T. W.
Shvartsman, L. A. *See* Travin, O. V.
Shyne, J. C., and **E. R. Morgan,** deboronization of steels, 189
Sibbitt, W. L. *See* McIntosh, G. E.
Šicha, M., gases and trace-elements effects in steelmaking, 290
Siedhiano, A., ultrasonic instruments, 388
Siegelin, D. L., rod mill at Kokomo, 293
Silverman, S., energy distribution of CO molecules in flames, 84
Simon, A., tempering effect on Cr-steel corrosion resistance, 394
Simons, E. N., life of Tropenas, 102
Simons, H. H., metal-bonding adhesives, 295
Simpson, A. G. *See* Titterington, R.
Simpson, E., belt repairs, 92
Sims, C. E. *See* Case, S. L.
Sims, P. K., geology of New Jersey magnetite district, 377
Singdale, F. N., brittle enamels for stress analysis, 95
Singh, R. *See* Chowdhury, K. P. R.
Sissener, J., electric-furnace pig production in Norway, 183
Sitnichenko, A. I. *See* In'shakov, N. N.
Skornyakova, O. N. *See* Kochergin, V. P.
Skudrzyk, E., ultrasonic testing, 388
Slabaugh, W. H., and **M. Grotheer,** filiform-corrosion mechanism, 101
Sloman, H. A., metal-powders gas-content determination, 385
Smales, A. A. *See* Milner, G. W. C.
Small, L., and **G. Sevick,** wire hardness test, 198
Smallman, R. E. *See* Williamson, G. K.
Smet, G. de. *See* de Smet, G.
Smetana, J. J. *See* Watt, J. R.
Smirnov, T. M. *See* Bol'shakov, I. F.
Smith, A. J. G., centrifugal casting, 89, 291
Smith, D., biographical note, 281; *see also* Thring, M. W.
Smith, D. M., and **H. G. Hague,** coal-washing plant at Bokaro, 85
Smith, F. W. *See* Brown, R. L.
Smith, G. C. *See* Dunmore, O. J.
Smith, G. V., dissolved nitrogen in graphitization, 390
Smith, H. C., cold-rolled sheets, 92
Smith, H. G. *See* Brown, D. J.
Smith, L. W. L., oxygen in malleable iron, 187
Smith, S., forgings flame hardening, 190
Smolich, S. A. *See* Zaitsev, G. P.
Snedden, W. P., taper-roller neck bearings, 293, 294
Snyder, F. L. Ver. *See* VerSnyder, F. L.
Socolofsky, J. F. *See* Killingsworth, R. B.
Solt, R., *Paper*: "Charging Delays due to Furnace Bunching," 260
Som, K. C. *See* Chatterjee, G. P.
Somers, S., obituary notice, 76
Sopena, J. A. B. *See* Mosquera, J. M. B. de C.
Soroka, W. W. *See* Gross, W. A.
Sotlar, M., elected Member, 210
Souillard, G., oils structure, 294
Sourdillon, A., tempering phenomena, 189
Souske, R., wire-galvanizing baths, 297; zinc impurities effects in galvanizing, 296
Soyejima, T. *See* Inouye, K.
Spalding, D. B., diffusion-flames extinction, 84
Spalding, J. C., jun. *See* Greco, E. C.
Spalenka, M., polarographic determination of chromium, 396
Spath, W., slip-band formation on deformed surfaces, 387
Speiser, R., and **J. W. Spretnak,** thermodynamics of binary interstitial solid solutions, 392
Spencer, J. R. *See* Carlisle, S. S.
Spencer, K. A., cathodic protection of ships and marine structures, 100
Spencer, K. A., and **D. A. Lewis,** cathodic protection, 302
Spencer, L. F., Hydroform process, 91; metal spinning, 91; welding dissimilar metals, 294
Spencer-Strong, G. H., porcelain-enamel and ceramic coatings, 196
Spengler, G., molybdenum disulphide as lubricant, 193
Spinedi, P. *See* De Carli, F.
Spitzer, H., crane-cab conditioning, 193
Sporck, C. L., Flowturn process, 292
Spretnak, J. W. *See* Speiser, R.
Springmann, K., crack testing by eddy current, 389
Spužic, M., elected Member, 210
Srinivasan, N. R., mining and metallurgy in Australia, 284
Stallwood, B. J., air-cooled electrodes for spectrochemical analysis of powders, 396
Stambke, K. *See* Förster, F.
Stansfield, C. J. *See* Conwell, C. B.
Stark, P., and **B. S. Lement,** temper-hardened austenite, 204
Starkey, F., *Paper*: "Guides and Strippers for Modern Rod and Bar Mills," 58; elected Member, 210
Starr, C. D. *See* Dorn, J. E.
Steele, J., thermit casting, 381
Steer, A. T., electropolishing, 295
Stein, H., solidification of steel in sand and chill moulds, 381
Steiner, R. H. *See* Seymour, R. B.
Steinitz, R., J. P. Scanlan, and **F. I. Zaleski,** iron-powder compacting for drawing, 384
Steinroeder, F., elected Member, 210
Stejspal, J., immersion pyrometer, 286
Stempfel, M., isothermal heat-treatment, 190
Sterke, A. de. *See* de Sterke, A.
Sternlof, A. U., quality control in wire-making, 191
Steven, W., and **G. Mayer,** *Paper*: "Continuous-Cooling Transformation Diagrams of Steels." *Discussion*, 353. *Correspondence*, 356. *Authors' Reply*, 357
Stevens, C. G., and **E. T. Turkdogan,** heats of formation of $Mn_3P_2O_8$ and $Mg_3P_2O_8$, 381
Stevens, H., and **H. Euler,** worth and weighting in job evaluation, 398
Stewart, J. W. *See* Sargent, J. K.
Stigzelius, H., mineral resources of Finland, 181
Stine, V. F., blast cleaning, 93
Stirling, A., *Paper*: "The Pelletizing of Northampton Sand Ironstones by Vacuum Extrusion." *Discussion*, 265. *Correspondence*, 269; *Author's Reply*, 270; award of Williams Prize, 373
Stocking, G. W., *Book*: "Basic Point Pricing and Regional Development," 304
Stoops, R. F. *See* Greenhouse, H. M.
Storchheim, S., drawing rate for stainless wire, 192
Štorek, V., and **J. Pech,** scrap sorting and storage, 290
Strähuber, F., and **A. Richter,** transmitter for oil-flow determination, 182
Strassburg, W. *See* Rose, A.
Strasser, F., springback in forming, 91
Strauss, S. W., L. E. Richards, and **D. G. Moore,** temperature effect on electrical resistivity of silicone and ceramic coatings, 196
Strel'nikov, I. A. *See* Gulyaev, A. P.
Stringer, L. F. *See* Harris, W. R.
Strohecker, R. F. *See* Herbek, E. W., jun.
Strambi, E., sulphur determination in solid fuels, 206
Strouth, H. S., Jamaican iron ore, 284
Stubbs, R. L., hot-dip galvanizing, 297
Such, T. E., nickel-plate crack prevention, 296
Sugarman, B., stainless powder compacts, 386; stainless-powder plate strength, 386
Sugarman, B., and **G. Collins,** stainless-powder filters, 386
Sugarman, B., and **C. T. J. Jessop,** stainless-powder gas-turbine blades, 386
Sully, A. H., E. A. Brandes, and **R. H. Brown,** oxidation-preventing coatings, 100
Sun, S. C., oxidation of coal, 85
Sutherland, A., elected Member, 210
Suzuki, T. *See* Maekawa, S.
Svahn, O., *Paper*: "Deep-Drawing Properties of Sheet Steel." *Correspondence*, 170. *Author's Reply*, 172
Swain, J. A., gaseous cementation, 190
Swann, B. R., heat-treating in steam, 90
Swartzman, E., agglomeration, 181
Sy, A. De. *See* De Sy, A.
Sylvester, E. Q., pressure pouring of steel wagon wheels, 187
Szczeniowski, J., recuperators, 378
Szczeniowski, J., and **P. Thierry,** blast-furnace working on sinter/Lorraine-ore burden, 287

Tagaya, M., and **S. Isa,** acid resistance of Cr steels, 206; prolonged-heating tests on high-temperature steels, 300
Tagaya, M., I. Tamura, and **S. Nabeshima,** quenching media, 292
Tagliaferri, A., and **C. Barbazanges,** induction furnaces in foundry, 187
Takahashi, K. *See* Takao, Z.
Takaki, H., S. Nakamura, Y. Nakamura, J. Hayashi, K. Furukawa, and **M. Aso,** single-crystal growing method, 99
Takao, Z., K. Takahashi, M. Nishihara, and **Y. Tanifuji,** temper brittleness, 198
Takase, T., G. Okamoto, H. Nakamura, T. Terada, and **S. Hashiguchi,** nodular-iron brake shoes, 198
Takashima, T., blooms defects, 382
Tamura, I. *See* Tagaya, M.
Tanaka, T., and **Y. Imai,** quenching hollow rod, 292
Tandy, P. W., refinery-plant inspection for corrosion, 206
Tanifuji, Y. *See* Takao, Z.
Tanimura, H., and **A. Omori,** coke reactivity, 378
Tapsell, H. G. *See* Forrest, P. G.
Tarnowski, L., rolling-mill drive breakdowns, 293
Tatoian, G. *See* Petrocelli, J. V.
Tator, K., protective painting, 196
Tatsukawa, I. *See* Hotta, H.
Tavard, basic converter, 289; *see also* Rajon
Tavernier, G., heating-furnace firing with S-containing oil fuel, 381; works-heating plant, 397
Taylor, G. M. *See* Dutli, J. W.
Taylor, H. F. *See* Bhattacharya, U. K., *also* Powell, R. G.
Taylor, J., coal and coke crushing, 378
Teindl, J., annealing atmospheres, 189
Temple, T. W. J., elected Member, 210
Tengstrand, G. *See* Alfort, S.
Tenney, G. H. *See* Dutli, J. W.
Terada, T. *See* Takase, T.
Terrat, S., open-hearth furnaces, 289
Terry, J. H., ceramic coatings, 196
Teuteberg, R., coal preparation in centrifugal separator, 285
Thein, K., coal wetting for dust reduction, 285
Theus, R. B. *See* Beach, L. A.
Thibaut, C. G., blast-furnace burden preparation, 183; hot-blast-stoves accumulation tests, 287; ironmaking in U.S.A., 379
Thierry, P., sintering at Knutange, 181; *see also* Szczeniowski, J.
Thomas, D. *See* Haynes, R.
Thomas, F. H. T., corrigendum, 78
Thomas, I. H., refinery metals, 391

Thomas, V., and **D. J. Jones,** low-expansion powder-metal Fe–Ni alloys, 386
Thomas, W. R., and **G. M. Leak,** carbon diffusion in α-iron, 301
Thompson, J. *See* Franks, R.
Thompson, J. H., iron and steel, 102
Thompson, W. P. *See* Atkinson, T. H.
Thompson, W. R., galvanized-structures inspection, 297
Thomsen, E. G., and **J. T. Lapsley, jun.,** stress analysis in plastic flow, 96
Thon, N., L. Yang, and **S. Yang,** electroplate surface-roughness determination, 93
Thorneycroft, D. R. *See* Ball, F. A.
Thring, M. W., fuel technology, 378
Thring, M. W., and **P. H. Price,** CO_2/C reactions rate in deep fuel beds, 285
Thring, M. W., and **D. Smith,** *Paper*: "An Improved Model for the Calculation of Heat Transfer in the O.H. Furnace," 227
Thum, A., and **K. Richard,** long-term creep tests, 97
Thun, R. *See* Boettcher, A.
Thurlow, G. G. *See* Barber, R.
Thury, W., cathodic protection, 302
Tierney, W. D. *See* Uhlig, H. H.
Tigerschiöld, M., *Paper*: "Aspects on Pelletizing of Iron-Ore Concentrates." *Discussion*, 265. *Correspondence*, 268. *Author's Reply*, 269
Tiller, W. A. *See* Morris, W.
Tilney, R., electrostatic coating, 93
Tinnion, R., elected Member, 210
Tipler, H. R. *See* Hopkins, B. E., *also* Rees, W. P.
Titterington, R., and **A. G. Simpson,** tantalum-powder production and fabrication, 384
Tompkins, A. G., cupola spray-type dust collector, 88
Torkar, K., and **G. F. Hüttig,** pore-volume designation of metal powders, 385
Tottori, T. *See* Okamoto, M.
Towler, F. H., hydraulic-presses control, 292
Townend, D. T. A. *See* Arthur, J. R.
Trafford, H. L., elected Member, 210
Travin, O. V., and **L. A. Shvartsman,** pig-iron desulphurization by soda ash, 379
Tremlett, H. F., Fortiweld steel, 201
Trenckle, C., metal flow in moulds, 185
Trenkler, H. A., converter LD process, 87
Trent, E. M., and **A. Carter,** sintered TiC alloys, 387
Trent, H. E., jun., optical pyrometers, 85
Trentini, B., oxygen-enriched-blast trials at Moyeuvre, 287
Treptow, K.-H. *See* Lueg, W.
Treupel, H. *See* Boettcher, A.
Trevoux, steel recuperators, 189
Trewhitt, R. C. E., heating-up new coke ovens, 85
Trinks, W., heating of steel, 189
Trocme, S. *See* Barbier, G.
Troiano, A. R., and **L. J. Klingler,** anisotropy in worked steels, 200
Trömel, G., metalloids recovery in basic Bessemer process, 380
Troost, N., electrostatic precipitators for boilers, 182
Trout, H. E. *See* Longenecker, C.
Tseitlin, Kh. L., corrosion by chlorine, 395
Tsuchida, S. *See* Ihida, M.
Tsuya, K. *See* Mitsuhashi, T.
Tsuya, N. *See* Hirone, T.
Turin, R. H., infra-red spectra of thermally excited gases, 84
Türk, T. *See* Kohlgrüber, J.
Turkdogan, E. T., *Paper*: "Sulphur Partition between Gas, Slag, and Metal Phases," 147; "Thermodynamics of Carbon Dissolved in Iron Alloys, Part II," 43; *see* Stevens, C. G.
Turkdogan, E. T., and **R. A. Hancock,** *Paper*: "Thermodynamics of Carbon Dissolved in Iron Alloys, Part III," 155
Turkdogan, E. T., R. A. Hancock, and **J. Pearson,** *Paper*: "Desulphurization of Carbon-Saturated Iron: Influence of Silicon, Manganese, and Aluminium," 338
Turkdogan, E. T., and **L. E. Leake,** *Paper*: "Thermodynamics of Carbon Dissolved in Iron Alloys, Part I," 39
Turnbull, H. F., elected Member, 210
Turner, A. E., optical pyrometers, 182
Turner, N. H., gas, water, and instrumentation at Appleby-Frodingham, 287
Turner, S. *See* Leadbeater, D. J.
Turner, T. H., boiler-water standards, 207
Tyson, J. D., handling trucks, 192

Uchiyama, M., and **F. Seki,** impact values of hollow-shank steels, 299
Ueno, M. *See* Mitsuhashi, T.
Uhlig, H. H., microstructural aspects of corrosion, 98
Uhlig, H. H., and **A. Geary,** potentials of Fe, Fe–Cr, and Ti in passivating solutions, 100
Uhlig, H. H., W. D. Tierney, and **A. McClellan,** fretting-corrosion test equipment, 101
Uhrus, L. O., iron-ore pelletizing, 267
Upton, J., jun. *See* McArthur, D. A.
Usatenko, Yu. M., and **P. A. Bulakhova,** determination of P in agglomerates, 303

Vach, A., roll-pressure formulæ, 292
Valkenburg, H. E. van. *See* van Valkenburg, H. E.
Vallet, P., C/O/Fe equilibrium, 99
Vallette, R., shear and slip, 197
Vána, F. *See* Sajch, L.
Van Atta, F., dermatitis prevention in foundry, 381
van den Bergh, A. W. J., ternary diagram for alloy cast irons, 185
Vanderpool, H., metallizing, 195
Vanderpool, H., and **A. P. Shepard,** metallizing, 195
Van Eeghem, J., J. Vidts, and **A. De Sy,** isothermal transformation diagrams for Cu–Cr and Ni–Cr cast irons, 204
van Krevelen, D. W. *See* Schuyer, J., *also* Zwietering, P.
van Krevelen, D. W., and **H. A. G. Chermin,** coal aromaticity and volatile matter 85
van Niewland, P. E. A., graphite-nodules formation, 187
van Valkenburg, H. E. *See* Cook, E. G.
van Zuilen, H. *See* Lips, E. M. H.
Varley, J. H. O., formation-heat calculation for binary alloys, 301
Vaughan, G. A. *See* McNeil, D.
Venard, P., ingot hot topping, 290; Maerz-furnace heat balance, 184
Vereinigte Österrische Eisen und Stahlwerke, A.G., LD steel acceptance tests, 97
Vernon, P. N., elected Associate, 210
Verrijp, M. B. *See* Fast, J. D.
VerSnyder, F. L., jet-engine steels, 199
VerSnyder, F. L., and **H. J. Beattie, jun.,** Laves and chi phases in Cr–Mo steels, 393
Versteeg, J. M., pipeline internal-corrosion detection instruments, 101
Vidal, G., rapid fatigue tests, 96
Vidts, J. *See* Van Eeghem, J.
Vierow, E. A., metallic recuperators, 378
Vitkovskii, M. N. *See* Rybasenko, I. D.
Vives, J. M. F., elected Member, 210
Vogt, W. A. *See* Rueckel, W. C.
von Batchelder, F. W., and **R. F. Raeuchle,** iron and nickel symmetries, 203
von Goldbeck, O. *See* Kubaschewski, O.

Wagauoff, N. P., pulverizing mills, 285
Wagman, F. H., elected Member, 210
Wagner, C., electropolishing theory, 93
Wagner, O. *See* Lehmann, K.
Waisman, J. L., and **A. Phillips,** stress analysis by layers removal, 96
Walker, E. V., D. K. Worn, and **R. E. S. Walters,** powder-metal magnetic-alloy strip, 386
Walker, J. *See* White, A. E. S.
Wallace, J. R., P. Fedora, and **N. D. Weiner,** blast-furnace-slag properties and uses, 86
Walles, K. F. A., biographical note, 176; *see also* Graham, A.
Wallgren, P. Å. *See* Alfort, S.
Wallwork, S. C., and **T. T. Harding,** X-ray photography method, 98
Walsh, R. L., elected Member, 210
Walter, L., closed-circuit television, 207; thermostatic control of plating baths, 296
Walters, R. E. S. *See* Walker, E. V.
Walton, H., elected Member, 210
Warburton-Brown, D., induction hardening, 291
Ward, H. D., biographical note, *facing* 208
Ward, R., elected Member, 210
Ward, W. E., duplexing at Consett, 173
Warner, M. F. *See* Pask, J. A.
Waterton, F. W., gas-turbine-rotor X-ray testing, 389
Watson, D. A., sprayed metals, 195
Watson, K. S., finishing-wastes treatment, 383
Watt, J. R., and **J. J. Smetana,** welding-electrodes test, 193
Weber, B. C., and **P. S. Hessinger,** silicon-base cermets, 300
Weber, D. *See* Penner, S. S.
Webster, D. McK. *See* Evans, E. R.
Weddle, M. *See* Lucas, G.
Wedow, H. *See* Hawkes, H. E.
Weeber, H. *See* Möller, H.
Wegmann, L., light-section mill, 192
Weiner, N. D. *See* Wallace, J. R.
Weitzer, H. P., LD oxygen-blown steels, 87
Welding Research Council, weld peening, 194
Weller, E. F., and **E. A. Hanysz,** thermoelectric sorter, 199
Wells, A. A., brittle fracture, 388
Wells, A. F., geometrics of crystal chemistry, 393
Welsh, A. F., hydraulic accumulators, 292
Welter, G. *See* Narduzzi, E. D.
Wendeborn, H., iron-ore pelletizing, 267
Wenderlich, K., hot pre-rolling for cold drawing, 191
Wenger, E., plastic sleeve-bearing friction characteristics, 383
Wenk, S. A. *See* Krieger, J.
Wennerstrand, B. *See* Kinnunen, J.
Wenninger, C. E., synthetic sands, 89
Wernick, J. H., limestone and dolomite decomposition energies, 286
Wert, C., dual C and Ni solution precipitation in α-iron, 301
Wesley, R. P. *See* Coffin, L. F., jun.
Wesley, W. A., and **B. B. Knapp,** weathering of Ni–Cr plate, 296
Wesner, A. L. *See* Scott, D. W.
Weston, F. R. *See* Bispham, T.
Wever, F. *See* Krisement, O.
Wever, F., and **W. Koch,** isothermal transformation of Cr steel, 204
Wever, F., and **A. Rose,** *Book*: "Atlas zur Wärmebehandlung der Stähle," 398; isothermal heat-treatment, 91
White, A. E. S., F. K. Earp, T. H. Blakely, and **J. Walker,** metal/ceramic bodies, 387
White, J. *See* Richards, R. G.
Whitehead, R. C., raw materials for Japanese iron and steel industry, 102
Whyte, M., statistical control in metal-working, 102
Wideröe, R., beta radiography, 199
Wiebke, G. *See* Kangro, W.
Wiester, H.-J., and **D. Horstmann,** curtain formation on galvanized sheets, 94; faults in galvanized sheets, 297; flashes on galvanized sheets, 94
Wilczek, A., steel wire drawing, 92
Wilder, A. B., E. F. Ketterer, and **D. B. Collyer,** creep-rupture properties, 300
Wilkinson, H. N., elected Member, 210

Wilks, C. R., N. A. Matthews, and **R. W. Kraft, jun.,** nodular-iron high-temperature properties, 390
Will, G., crane-hook and ladle-hanger fractures, 197
Williams, A. E., powder metallurgy, 196; *see also* Murray, P.
Williams, Betty E., diffraction-grating copies for electron microscopy, 98
Williams, C., and **R. A. F. Hammond,** electroplate adhesion test, 296
Williams, E. J., elected Member, 210
Williams, E. J., and **E. J. Burton,** *Paper* "Use of a Thermal Model to Determine Temperature under Blast-Furnace Hearths," 17
Williams, H. J. *See* Nesbitt, E. A.
Williams, H. J., R. M. Bozorth, and **Matilda Goertz,** magnetite low-temperature transition mechanism, 393
Williams, J., powders hot compacting, 386
Williams, L. S., and **P. Murray,** bonding in cermets, 196
Williams, W., lubrication, 193
Williams, W. J., effect of casting temperature on chill and mottle, 186
Williams, W. S. *See* Brandt, D. J. O.
Williamson, G. K., and **R. E. Smallman,** Fourier analysis of X-ray line broadening, 393
Wilman, H., biographical note, 176; *see also* Agarwala, R. P.
Wilsdon, S. C. *See* Oliver, D. A.
Wilson, D. V., cold-work effects on cementite, 392
Wilson, H. C., acid resistance of porcelain enamels, 196
Wilson, R. H., jun., J. B. Conway, A. Engelbrecht, and **A. V. Grosse,** H–F flame temperature, 84
Wilson, R. W., heat-treating plant, 189
Wilson, S. C., and **P. J. Ridout,** sintered nickel steel, 386
Winegard, W. C. *See* Morris, W.
Winsor, R., elected Member, 210
Winter, Christiane. *See* Bastien, P.
Winterton, K., diffusion of nitrogen in iron, 351; weldability dilatation tests, 355
Winzig, W. J., water treatment, 206
Wirtz, H., sampling ferro-alloys and ores, 185
Wistreich, J. G., wire-drawing dies, 92
Withey, S. H., plating-plant depreciation calculation, 296
Wogrinz, A., metal colouring, 296
Wolfhard, H. G. *See* Gaydon, A. G.
Wölk, H., photometric determination of trace silicon, 302
Wood, D. R., *Paper*: "A Note on Hairline Cracking," 317
Woodfine, B. C., hardness effect on brittle-transition temperature, 198
Woodward, R., elected Associate, 210
Woolley, F. A., electrode-modified cupola, 186
Wooster, W. A., crystals X-ray scattering, 204
Work, C. E., and **T. J. Dolan,** temperature and strain-rate effects on metals in torsion, 387
Worley, E. M., elected Associate, 210
Worn, D. K. *See* Walker, E. V.
Worstenholme, G. M., elected Member, 210
Wright, D. K., and **J. R. Jeromson, jun.,** silver-painted slip rings, 95
Wright, K. H., rolls, 293
Wright, K. H. R., fretting corrosion, 395
Wurth, J., oxygen-blown basic Bessemer steels, 87, 380
Wusatowski, Z., rolling formulæ, 293
Wusatowski, Z., and **S. Bala,** roll-pressure calculation, 382

Yada, K. *See* Hibi, T.
Yagihashi, T., and **Z. Shibata,** Al equilibria in liquid iron, 87
Yamaguchi, S., electron-microscope focusing method, 98
Yamamoto, S. *See* Sawamura, H.
Yamanaka, N., and **K. Kusaka,** effects of V and Mn on Cr die steel, 200
Yamanaka, N., and **K. Sato,** heat brittleness, 300
Yang, L. *See* Thon, N.
Yang, S. *See* Thon, N.
Yardley, J. T. *See* Johnson, W. C.
Yavoiskii, V. I. *See* Lakomskii, V. I.
Yokobori, T., delayed yield and strain rate, 387
Yonezawa, T. *See* Saheki, M.
Yoshizaki, K., T. Ando, K. Ariga, and **Y. Miyamoto,** tinplate greyness, 195

Zagar, L. *See* Schwiete, H. E.
Zaitsev, G. P., and **S. A. Smolich,** plasticity determination by cone indentation 300
Zaleski, F. I. *See* Steinitz, R.
Zambrow, J. L. *See* Sheinhartz, I.
Zang, V. E., and **G. J. Grott,** moulding-sand *p*H relationships, 89
Zapffe, C. A., Russian technical books, 102
Zavrazhin, A. G. *See* Gulyaev, A. P.
Zhuravskaya, V. I., photometric analysis of open-hearth slags, 303
Zieba, J., slag-basicity reduction in open-hearth, 289
Zinn, R. E., low-temperature coking, 286
Zizelmann, G. *See* Förster, F.
Zlatnik, D. F. *See* Fisher, C. E.
Zuilen, H. van. *See* van Zuilen, H.
Zuithoff, A. J., high-carbon cupola coke, 88
Zuliani, G., Duffield ironmaking process, 288
Zwietering, P., and **D. W. van Krevelen,** coal pore structure, 85

HARRISON & SONS LTD., By Appointment to Her Majesty The Queen, Printers, London, Hayes (Middx.) and High Wycombe